



Office of General Services

DESIGN & CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 1 TO PROJECT NO. 46121

CONSTRUCTION, HVAC, ELECTRICAL AND PLUMBING WORK
PROVIDE WET LAB, 6TH FLOOR, BUILDING 4
NEW YORK PSYCHIATRIC INSTITUTE
1051 RIVERSIDE DR
NEW YORK, NY 10032-1007

July 1, 2025

<p>NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.</p>
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BIDDING REQUIREMENTS – COMMON

1. DOCUMENT 003126 EXISTING HAZARDOUS MATERIAL INFORMATION: Discard the section bound in the Project Manual and substitute with the accompanying Section (page 003126 – 1) noted “Printed 6/27/2025”.

SPECIFICATIONS – CONSTRUCTION WORK

2. DOCUMENT 115313 LABORATORY FUME HOODS: Discard the Document bound in Project Manual and substitute with the accompanying Document (pages 115313 – 1 thru 115313 – 10) noted “Printed 6/27/2025”.
3. DOCUMENT 123553 LABORATORY CASEWORK: Discard the Document bound Project Manual and substitute with the accompanying Document (pages 123553 – 1 thru 123553 – 21) noted “Printed 6/27/2025”.

APPENDIX – CONSTRUCTION

4. SCHEDULE OF SUBMITTALS: Discard the section bound in Project Manual and substitute with the accompanying Document noted “Printed 6/27/2025”.

END OF ADDENDUM

Brady M. Sherlock, P.E.
Director, Division of Design
Design & Construction

DOCUMENT 003126

EXISTING HAZARDOUS MATERIAL INFORMATION

1.01 ASBESTOS SURVEY REPORT

Samples listed in the report were collected at the Project Site and tested for Asbestos Containing Materials (ACM). The report was compiled for New York State Office of General Services, Design and Construction Group by an ELAP certified laboratory. In order to determine the Asbestos content, samples were analyzed by polarized light microscopy (PLM) and/or transmission electron microscopy (TEM). The report is intended for the State design and estimate purposes only, and is included to provide bidders with that same information available to the State. The Bulk Samples are representative of Homogeneous Area (HA) and is defined as a suspect material of similar age, appearance, function and texture. All field information was organized in accordance with 40 CFR Part 763, Asbestos Hazard Emergency Response Act (AHERA). See the 'Renovation Survey for Asbestos-Containing Materials, Lead-Based Paint & PCBs' report included in the Appendix for type, condition, location and approximate quantity of ACM.

1.02 LEAD SURVEY REPORT

Samples listed in the report were collected at the Project Site and tested for Lead content. The report was compiled for New York State Office of General Services, Design and Construction Group by an ELAP certified laboratory. In order to determine the lead content the Atomic Absorption method or a XRF Analyzer was used. This report is intended for State design and estimate purposes only, and is included to provide bidders with the same information available to the State. The samples are representative of like materials in the Work area. All lead containing materials may not have been sampled. See the 'Renovation Survey for Asbestos-Containing Materials, Lead-Based Paint & PCBs' report included in the Appendix for details.

1.05 PCB SAMPLING REPORT

Samples listed in the report were collected at the Project Site and tested for PCBs. The report was compiled for New York State Office of General Services, Design and Construction Group by an ELAP certified laboratory. Bulk, wipe or air sampling was used in determining the PCB content. This report is intended for State design and estimate purposes only, and is included to provide bidders with the same information available to the State. All PCB containing materials may not have been sampled. See the 'Renovation Survey for Asbestos-Containing Materials, Lead-Based Paint & PCBs' report included in the Appendix for details.

END OF DOCUMENT

SECTION 115313
LABORATORY FUME HOODS

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Submit Laboratory Fume Hood submittals concurrent and coordinated with laboratory casework submittals specified in Section 12 35 53 "Laboratory Casework."

1.02 SUMMARY

- A. Section Includes:
 - 1. Laboratory fume hoods types as indicated on drawings.
 - 2. Piping and wiring within fume hoods for service fittings, light fixtures, and other electrical devices included with fume hoods.
 - 3. Fume hood base cabinets.
 - 4. Work tops within fume hoods.
 - 5. Laboratory sinks and cup sinks in fume hoods.
 - 6. Water, laboratory gas, and electrical service fittings in fume hoods.

1.03 SUBMITTALS – GENERAL

- A. Submit Laboratory Fume Hood submittals concurrent and coordinated with laboratory casework submittals specified in Division 12 Section "Laboratory Casework."

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Key fume hood using same designation as indicated on Drawings.
 - 2. Service Fittings: Include product cut-sheets for each type of fitting and finish. Use same designation as indicated on Drawings.
- B. Shop Drawings: For laboratory fume hoods.
 - 1. Include plans, elevations, sections, and attachment details. Include layout of fume hoods in relation to laboratory casework, equipment and other building construction.
 - 2. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports. Include calculations demonstrating that anchorages comply with seismic performance requirements.

3. Indicate locations and types of service fittings together with associated service supply connection required.
 4. Indicate duct connections, electrical connections, and locations of access panels.
 5. Include roughing-in information for mechanical, plumbing, and electrical connections.
 6. Key fume hoods using same designation as indicated on drawings.
- C. Samples: For fume hood exterior finishes, interior lining and work top material(s), service fitting finishes and other materials requiring color selection.
- D. Delegated-Design Submittal: For fume hoods indicated to comply with seismic performance requirements and design criteria.

1.05 INFORMATIONAL SUBMITTALS

- A. Product Test Reports for Laboratory Fume Hoods: Showing compliance with specified performance requirements for as-manufactured containment and static pressure loss, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for each type and size of fume hood.
- B. Product Test Reports for Chemical Resistant Finish System: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of chemical resistant finish system with requirements of specified product standard.
- C. Product Test Reports for Laboratory Fume Hood Work Top Materials: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of work top materials with requirements specified for chemical resistance.
- D. Field quality control reports.

1.06 CLOSE-OUT SUBMITTALS

- A. Operation and maintenance data.

1.07 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory fume hoods until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during remainder of construction period.
- B. Field Measurement: Verify actual dimensions of openings and construction contiguous with laboratory casework by field measurements before fabrication.
1. Establish Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.08 EXTRA MATERIALS

- A. Furnish complete touchup kit for each type and color of laboratory fume hood materials provided. Include fillers, primers, paints, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory fume hood finishes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design Manufacturer: Subject to compliance with requirements, provide Lab Crafters, Inc. products indicated below, or comparable products by one of the following indicated below:
 - 1. Basis of Design Products – Lab Crafters, Inc., Air Sentry V2, constant air volume with vertical sash and under-counter acid/flammable cabinet:
 - 2. Comparable products by one of the following:
 - a. Air-Master System Corporation.
 - b. Bedcolab Ltd.
 - c. Institutional Casework, Inc.; Jamestown Metal Products.
 - d. Labconco Corporation.
 - e. Mott Manufacturing Ltd.
- B. Source Limitations: Obtain laboratory fume hoods from single source from single manufacturer, unless otherwise indicated.
 - 1. Obtain laboratory fume hoods through same source and same manufacturer as laboratory casework specified in Division 12 Section “Laboratory Casework.”
 - 2. Obtain laboratory work tops through same source and same manufacturer as specified in Division 12 Section “Laboratory Casework.”
 - 3. Obtain laboratory water and gas service fittings through same source and same manufacturer as specified in Division 12 Section “Laboratory Casework.”
- C. Product Designations: Drawings indicate sizes, types, and configurations of fume hoods by referencing designated manufacturer's catalog numbers. Other manufacturers' fume hoods of similar sizes, types, and configurations, and complying with the Specifications, may be considered.

2.02 PERFORMANCE REQUIREMENTS

- A. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110-1995, as modified below at a release rate of 4.0 L/min:
 - 1. As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm).
 - 2. As-Installed (AI) Rating: AI 0.10 (0.10 ppm).

3. Average Face Velocity – Vertical Rising Sash (CAV Exhaust): 100 fpm (0.31 m/s) plus or minus 10 percent with sash at operating height of 18 inches (457 mm)
4. Face-Velocity Variation: Not more than 20 percent of average face velocity across the face opening with sashes fully open.
- B. Static-Pressure Loss: Not more than 1/2-inch wg (124 Pa) at 100-fpm (0.51-m/s) face velocity with sash fully open when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.
- C. Delegated Design: Engage a qualified professional engineer to design fume hoods for seismic performance.
- D. Seismic Performance: Fume hoods, including attachments to other work, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and the applicable building code.
 1. The term “withstand” means the unit will remain in place without separation of any parts from the device when subjected to seismic forces indicated.

2.03 FUME HOODS

- A. Product Standards: Comply with SEFA 1, "Laboratory Fume Hoods - Recommended Practices." Provide fume hoods UL listed and labeled for compliance with UL 1805.
- B. Bypass (CAV – Constant Air Volume) Fume Hoods: Provide bypass fume hoods. Compensating bypass above the sash opens as sash is closed. Provide sufficient bypass capacity so that face velocity with sash opening of 6 inches does not exceed 3 times the face velocity with sash fully open.
- C. Ventilation Rate: Fume hoods shall be designed to operate at nominal face velocities, total exhaust rates (CFM) and containment requirements indicated. Refer to Mechanical drawings for maximum allowable fume hood exhaust ventilation rates.

2.04 MATERIALS

- A. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.
- B. Glass-Fiber-Reinforced Polyester: Polyester laminate with a chemical-resistant gel coat on exposed faces and having a flame-spread index of 25 or less according to ASTM E 84.
- C. Glass: Clear tempered safety glass complying with ASTM C 1048, Kind FT, Condition A, Type I, Class I, Quality Q3; not less than 5.0 mm thick.
 1. Permanently mark safety glass with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Fasteners: Provide stainless-steel fasteners where exposed to fumes.

2.05 FABRICATION

- A. General: Assemble fume hoods in factory to greatest extent possible. Disassemble fume hoods only as necessary for shipping and handling limitations. Fume hoods shall be capable of being partly disassembled as necessary to permit movement through a 35-by-79-inch (889-by-2007-mm) door opening.
- B. Steel Exterior: Fabricate from steel sheet, 0.048 inch (1.21 mm)/ 18 gauge thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings. Apply chemical-resistant finish to interior and exterior surfaces of component parts before assembly.
- C. Fiberglass Exterior: Fabricate from glass-fiber-reinforced polyester components not less than 1/4 inch (6.35 mm) thick, bonded together to maximum extent practical. Trim edges of panels with PVC extrusion. Limit removable parts to access panels, front fascia, and airfoil.
- D. Ends: Fabricate with double-wall end panels without projecting corner posts or other obstructions to interfere with smooth, even airflow. Close area between double walls at front of fume hood and as needed to house sash counterbalance weights, utility lines, and remote-control valves.
- E. Splay top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.
- F. Interior Lining: Provide the following unless otherwise indicated:
 - 1. Glass-fiber-reinforced polyester, not less than 3/16 inch (4.75 mm) thick.
- G. Lining Assembly: Unless otherwise indicated, assemble with stainless-steel fasteners or epoxy adhesive, concealed where possible. Seal joints by filling with chemical-resistant sealant during assembly.
 - 1. Fasten lining components together with galvanized steel cleats or angles to form a rigid assembly to which exterior panels are attached.
 - 2. Punch fume hood lining side panels to receive service fittings and remote controls. Provide removable plug buttons for holes not used for indicated fittings.
 - 3. Interior Access Panels: Provide interior gasketed access panels at end wall panels of fume hoods for access to end wall utility services, unless otherwise required by manufacturer for special purpose hood type conditions.
- H. Rear Baffle: Unless otherwise indicated, provide baffle, of same material as fume hood lining, at rear of hood with openings at top and bottom. Secure baffle to cleats at rear of hood with stainless-steel screws. Fabricate baffle for easy removal for cleaning behind baffle.
 - 1. Provide preset baffles.
 - 2. Provide baffle materials with smooth edges and opening.
 - 3. Provide epoxy-coated, stainless-steel screen at bottom baffle opening to prevent paper from being drawn into the exhaust plenum behind baffles.
- I. Exhaust Plenum: Full width of fume hood and with adequate volume to provide uniform airflow from hood, of same material as hood lining, and with duct stub for exhaust connection.
 - 1. Duct-Stub Material: Type 316L stainless steel with chemical-resistant finish
- J. Bypass Grilles: Provide grilles at bypass openings of fume hoods.
- K. Sashes: Provide operable sashes of type indicated.
 - 1. Fume hood sash shall be full view type with unobstructed, side-to-side view of fume hood interior.

2. Vertical Rising Sash: Fabricate sash with aerodynamic aluminum construction with chemically resistant coating. Form into four-sided frame with bottom corners welded and finished smooth. Make top member removable for glazing replacement. Set glazing in chemical-resistant, U-shaped gaskets. Bottom rail shall be an integral, formed, full width, flush pull, and shall be anchored on each side to sash counterbalance system at bottom. Provide rubber bumpers at top and bottom of each sash unit.
3. Counterbalance vertical-sliding sash with single sash weight and stainless-steel aircraft cable system to hold sash in place regardless of position. Provide ball-bearing pulleys, sheaves, and plastic glides in stainless-steel guides. Rear pulleys shall be connected by a timing shaft to prevent sash tilting. Design system to hold sash at any position without creep and to prevent sash drop in the event of cable failure.
 - a. Counterbalance System Option: In lieu of sash weight and cable system above, provide sash weight, chain and ball-bearing sprockets system. Rear sprockets shall be connected by a timing shaft to prevent sash tilting. Design system to hold sash at any position without creep and to prevent sash drop in the event of chain failure.
4. Glaze sash with tempered safety glass, unless otherwise indicated
5. Sash Opening Height: Provide the following clear sash opening, measured from top of work surface to bottom of sash in full-open position.
 - a. Bench-Top Fume: Nominal 28 inches.
- L. Airfoil: Unless otherwise indicated, provide airfoil at bottom of fume hood face opening with 1-inch (25-mm) space between airfoil and work top. Sash closes on top of airfoil, leaving 1-inch (25-mm) opening for air intake. Airfoil directs airflow across work top to remove heavier-than-air gases and to prevent reverse airflow.
 1. Fabricate airfoil from stainless steel. Provide airfoil with cord-keeper slots each end to allow sash to close completely when electrical cords from equipment inside the hood are plugged into receptacles located on the hood corner posts.
- M. LED Light Fixtures: Provide vaporproof, high-efficiency, quick-start, LED lighting system, including lamps at each fume hood. Shield lighting system from hood interior with 1/4-inch- (6.35-mm-) thick laminated glass or 3-mm-thick tempered glass, sealed into hood with chemical-resistant rubber gaskets. Provide units with LED lighting system easily replaceable from outside of fume hood.
 1. Provide LED lighting system with color temperature of 4000K and minimum color rendering index of 85.
 2. 4 Foot Hoods: 2 each, 36 inch (914 mm) 11-watt LED lamps.
 3. 5 Foot Hoods: 2 each, 48 inch (1219 mm) 17-watt LED lamps.
 4. 6 Foot Hoods: 2 each, 48 inch (1219 mm) 17-watt LED lamps.
 5. 8 Foot Hoods: 4 each, 36 inch (914 mm) 11-watt LED lamps.
- N. Filler Strips: Provide as needed to close spaces between fume hoods or fume hood base cabinets and adjacent building construction. Fabricate from same material and with same finish as fume hoods or fume hood base cabinets, as applicable.
- O. Ceiling Enclosure: Provide filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling. Equip front of enclosure panels with removable panel to provide means of access to top of hood and light fixture.

- P. Finished Back Panels: Where rear surfaces of fume hoods are exposed to view, provide finished back panels matching rest of fume hood enclosure.
- Q. Comply with requirements in other Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring. Install according to Shop Drawings. Securely anchor fittings, piping, and conduit to fume hoods unless otherwise indicated.
 - 1. Pre-Wiring: Fume hoods shall be pre-wired to an accessible junction box(s) on top of fume hood. Refer to Division 26 Sections for wiring, conduit and box materials.
 - a. Provide separate circuits for each side of fume hood sash opening; each side rated at 20 amps. Combine fume hood lighting with circuit on one side of sash opening (Contractor's choice).
 - b. Provide light switch at fume hood sash opening per manufacturer.
 - 2. Pre-Piping: Fume hood water and laboratory gas services shall be pre-piped to 6 inches (154 mm) above top of fume hood, at back of fume hood. Refer to Division 22 and 23 Sections for piping and insulation materials for each type of service.

2.06 FUME HOOD BASE CABINETS, WORK TOPS, SINKS AND SERVICE FITTINGS

- A. Base Cabinets: Comply with Division 12 Section "Laboratory Casework."
- B. Work Tops, Sinks and Cup Sinks: Comply with Division 12 Section "Laboratory Casework" for top and sink materials indicated.
 - 1. Bench Top Fume Hood Work-Top Configuration: Raised (marine) edge, 1-1/4 inch (32 mm) thick at raised edge, with beveled edge and corners. Raised front edge of work surface shall extend no more than 2-1/2 inch (64 mm) from inside face of sash.
 - 2. Where cup sinks occur in work tops, provide surface installation bonded to tops with sealed joint, and 1/4 inch (6.35 mm) high raised edge around perimeter of cup sink.
 - 3. Where epoxy sinks occur in epoxy work tops, provide integral sinks bonded to tops with invisible joint line.
 - 4. Where corrosive storage or other special purpose storage cabinets occur below fume hoods and are indicated to be vented into fume hood chamber, provide work top opening through back of raised edge of work surface for vent tubing from cabinet up into fume hood chamber behind rear baffle, as indicated on Drawings.
- C. Sinks and Cup Sinks: Comply with Division 12 Section "Laboratory Casework" for materials and sizes indicated.
- D. Service Fittings:
 - 1. Water and Laboratory Gas Service Fittings: Comply with Division 12 Section "Laboratory Casework."
 - 2. Electrical Service Fittings: Provide UL listed units with metal housings, accessories and gaskets required for mounting in laboratory fume hoods.
 - a. Receptacles: Specification grade, 120V GFCI devices, duplex type NEMA 5-20R, unless otherwise indicated, with indicator light that is lighted when device is tripped.
 - b. Light Switches: Single pole type.

- c. Receptacle and Switch Colors: Comply with requirements specified in Division 26 Sections, unless otherwise indicated or required by NFPA 70.
- d. Cover Plates: Provide Type 304 stainless steel, satin finish cover plates with formed and beveled edges.
- e. Cover Plate Identification: Comply with requirements specified in Division 26 Sections.

2.07 METAL FINISH

- A. Preparation: Clean surfaces of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.
- B. Prepare, treat and finish welded assemblies after assembling. Prepare, treat and finish components that are mechanically fastened before assembly. Prepare, treat and finish concealed surfaces same as exposed surfaces.
- C. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply fume hood manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).
 - 1. Chemical and Physical Resistance of Finish System: Finish shall comply with acceptance levels of cabinet surface finish tests in SEFA 8M. Acceptance level for chemical spot test shall be no more than four Level 3 conditions and results shall be within the range indicated for each chemical reagent.
 - 2. Colors for Fume Hood Finish: As selected by Architect from manufacturer's full range.
 - 3. Colors for Fume Hood Base Cabinet Finish: Match fume hood exterior finish.

2.08 ACCESSORIES

- A. Fume Hood Air Flow Controller, Alarm and Sash Position Sensor: Controller, alarm and sash position sensor to be provided by Division 23 Section for field installation. Provide fume hood with factory cutouts and brackets for controller and accessories.
- B. Airflow Indicator and Alarm: Provide each fume hood with manufacturer's standard airflow indicator with audible and visual alarm that activates when airflow sensor reading is outside of preset range.
 - 1. Indicator Type: Thermal anemometer that measures fume hood face velocity and displays data as digital readout.
 - 2. Provide with thermal-anemometer airflow sensor.
 - 3. Provide with reset and test switches.
 - 4. Provide with switch that silences audible alarm and automatically resets when airflow returns to within preset range.
- C. Sash Stops: Provide fume hoods with sash stops to limit hood opening to sash operating height of 18 inches (457 mm), unless otherwise indicated. Sash stops can be manually released to open sash fully for cleaning fume hood and for placing large apparatus within fume hood.

1. Provide sash stop at full-open sash position to assist with loading/unloading.
- D. Labels: Fume- and reagent-resistant plastic material, identifying operating height and face velocity, and hood safety practices.
- E. Bypass Grille Blank-off Panel: Provide fume hoods with blank-off panel on bypass grille designed for use with sash stops to reduce exhaust air volume and provide design face velocity with sash at operating height indicated.

2.09 SOURCE QUALITY-CONTROL

- A. Demonstrate fume hood performance before shipment by testing one fume hood of each type required according to to ASHRAE 110 as modified in “Performance Requirements Article. Provide testing facility, instruments, equipment, and materials needed for tests.
- B. Prepare test reports.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Install fume hoods according to manufacturer's written instructions. Install level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework. Securely attach access panels but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
 1. Seal joint between work top and fume hood structure with sealant recommended by manufacturer of fume hood and work top materials.
- B. Comply with requirements in Division 12 Section “Laboratory Casework” for installing fume hood base cabinets, work tops, and sinks.
- C.

3.02 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer’s Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections and to assist in testing.
- C. Field test installed fume hoods according to ASHRAE 110 as modified in “Performance Requirements” Article to verify compliance with performance requirements.
 1. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.

2. After making corrections, retest fume hoods that failed to perform as specified.
- D. Field test installed fume hoods according to "Flow Visualization and Velocity Procedure" requirements in ASHRAE 110 as modified in "Performance Requirements" Article to verify compliance with performance requirements.
 1. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.
 2. After making corrections, retest fume hoods that failed to perform as specified.
- E. Coordinate field testing of fume hoods with requirements of Division 23 Section "Testing, Adjusting and Balancing."
- F. Prepare test and inspection reports.

3.03 ADJUSTING AND CLEANING

- A. Adjust moving parts for smooth, near silent, accurate sash operation with one hand. Adjust sashes for uniform contact of rubber bumpers. Verify that counterbalances operate without interference.
- B. Clean finished surfaces, including both sides of glass; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting fume hoods to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.04 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain laboratory fume hoods.

END OF SECTION

SECTION 123553

LABORATORY CASEWORK

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Submit Laboratory Casework submittals concurrent and coordinated with laboratory fume hood submittals specified in Section 11 53 13 "Laboratory Fume Hoods."

1.02 SUMMARY

- A. Section Includes:
 - 1. Metal laboratory casework.
 - 2. Metal laboratory casework with wood door and drawer fronts.
 - 3. Special purpose laboratory casework.
 - 4. Shelving.
 - 5. Adaptable laboratory casework systems.
 - 6. Laboratory work surfaces.
 - 7. Laboratory sinks.
 - 8. Casework accessories.
 - 9. Water, laboratory gas, safety, and electrical service fittings.
 - 10. Ceiling Service Panels

1.03 DEFINITIONS

- A. MDF: Medium-density fiberboard.
- B. Hardwood Plywood: A panel product composed of layers, or plies, of veneer, or of veneers in combination with lumber core, hardboard core, MDF core, or particleboard core, joined with adhesive and faced both front and back with hardwood veneers.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Laboratory Casework: Include casework cabinet styles, dimensions, and standard construction details for each type of cabinet, table, and other system specified.
 - 2. Flammable Liquid and Hazardous Material Storage Cabinets: Show compliance with specified reference standards, testing by recognized agencies, and application of testing labels.
 - 3. Composite Wood Products: Product data indicating that products contain no added urea formaldehyde.

4. Adhesives: Product data indicating that products contain no added urea formaldehyde.
- B. Shop Drawings: For laboratory casework. Include plans, elevations, sections, and attachment details.
 1. Show details of anchoring to permanent building construction, including locations of blocking, reinforcements, and other supports required for installation.
 2. Include locations of clearances from adjoining walls, doors, ceilings, and other building construction.
 3. Include coordinated dimensions for laboratory casework, laboratory fume hoods, laboratory equipment, and laboratory accessories specified in other Sections.
 4. Include rough-in information for mechanical, plumbing and electrical services. Show locations and size of cutouts and holes for service fittings, and other items installed in laboratory casework.
- C. Samples: For cabinet finishes, hardware finishes, countertops, service fittings finishes, and other materials requiring color selection.
- D. Delegated-Design Submittal: For laboratory casework indicated to comply with seismic performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

- A. Product Test Reports for Casework: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework with requirements of specified product standard.
- B. Product Test Reports for Countertop Surface Material: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory countertop surface materials with requirements specified for chemical resistance.
- C. Product Certificates: For the following:
 1. Composite wood products.
 2. Adhesives.

1.06 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA 8 applicable to cabinet material(s) specified.

1.08 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during remainder of construction period.

- B. Field Measurements: Verify actual dimensions of openings and construction contiguous with laboratory casework by field measurements before fabrication.
 - 1. Establish Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.09 EXTRA MATERIALS

- A. Furnish complete touchup kit for each type and color of laboratory casework materials provided. Include fillers, primers, paints, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finishes.
- B. Furnish extra materials that match products installed and that are packaged with protective coverings for storage and identified with labels describing contents.
 - 1. Cabinet Mounting Clips and Related Hardware: Quantity equal to 5 percent of amount installed, but no fewer than 20 of each type.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Laboratory Casework Basis of Design Manufacturer: Subject to compliance with requirements, provide products by Lab Crafters, Inc. as indicated below, or comparable products by one of the following indicated below:
 - 1. Basis of Design Products –Lab Crafters, Inc.
 - a. Metal Laboratory Casework: Fixed casework, overlay wood fronts
 - b. Adaptable Laboratory Casework System – Moveable Workstation System: Dimension System.
 - 2. Comparable products by one of the following:
 - a. Institutional Casework, Inc. (ICI)
 - b. Kewaunee Scientific Corporation
 - c. Mott Manufacturing Ltd.
- B. Epoxy Resin: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Epoxy Scientific, LLC.
 - 2. Durcon, Inc.
 - 3. Kewaunee Scientific Corporation.
- C. Water, Laboratory Gas and Electrical Service Fitting Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Broen, Inc.
 - 2. Chicago Faucet, a Geberit Company.
 - 3. Water Saver Faucet Co.
- D. Source Limitations: Obtain laboratory casework from single source from single manufacturer unless otherwise indicated.
 - 1. Obtain laboratory casework through same source and same manufacturer as laboratory fume hoods specified in Division 11 Section “Laboratory Fume Hoods.”

2.02 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design laboratory casework systems and support framing system, including attachments to other work.
- B. Seismic Performance: Laboratory casework systems and support framing system, including attachments to other work, shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and the applicable building code.
 - 1. Refer to Structural Drawings for seismic design criteria.
 - 2. The term “withstand” means the unit will remain in place without separation of any parts from the device when subjected to seismic forces indicated.

2.03 CASEWORK, GENERAL

- A. Metal Casework Product Standard: Comply with SEFA 8M, “Laboratory Grade Metal Casework.”
- B. Wood Casework Product Standard: Comply with SEFA 8W, “Laboratory Grade Wood Casework.”
- C. Adaptable Laboratory Casework System Product Standards: Comply with SEFA 10 “Adaptable Laboratory Furniture Systems” for the following type of assemblies:
 - 1. Moveable (Free Standing) Workstations: Comply with SEFA 10, Class 7. Provide pre-wired workstations UL listed and labeled for compliance with UL 61010-1.
- D. Work Surface Product Standard: Comply with SEFA 3, “Laboratory Work Surfaces.”
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.04 MATERIALS

- A. Steel Materials:
 - 1. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A 1008/A 1008M; matte finish; suitable for exposed applications.
 - 2. Stainless-Steel Sheet: ASTM A 666/A 666M, stretcher-leveled standard of flatness.
 - a. Cabinets: Type 304.
- B. Wood Materials:
 - 1. Wood Casework Species and Cut: White maple, quarter cut.
 - 2. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
 - 3. Adhesives: Do not use products that contain urea formaldehyde.
 - 4. Composite Wood Products: Products shall be made without urea formaldehyde.
 - 5. Hardwood Plywood: HPVA HP-1, either veneer core or particle board core, unless otherwise indicated, made without urea formaldehyde.
 - 6. Medium Density Fiberboard (MDF): ANSI A208.2, Grade 130, made with binder containing no urea formaldehyde.
 - 7. Particleboard: ANSI A208.1, Grade M-2, exterior glue, made with binder containing no urea formaldehyde.
 - 8. Hardboard: AHA A135.4, Class 1 Tempered.

- C. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, nonspecular finish, and having a flame-spread index of 25 or less according to ASTM E 84.
 - 1. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi (70 MPa).
 - b. Modulus of Elasticity: Not less than 2,000,000 psi (14000 MPa).
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 deg F (127 deg C).
 - 2. Chemical Resistance: Epoxy-resin material in specified color, when tested with reagents according to SEFA 3 "Work Surfaces Chemical/Stain Resistance Test," shall have no more than four Level-3 conditions.
 - 3. Color: Black, as selected by Architect from epoxy manufacturer's full range.

2.05 AUXILIARY MATERIALS

- A. Furring, Blocking, Shims and Hanging Strips: Softwood or hardwood lumber, fire-retardant-treated, kiln-dried to less than 15 percent moisture content.
- B. Sealants:
 - 1. Sealant Joints and Penetrations in Work Surface Material: Silicon sealant recommended by work surface manufacturer.
 - 2. Sealant Joints Between Laboratory Casework and Adjoining Construction: Refer to Division 07 Section "Sealants."
- C. Corrosives (Acids, Bases) Storage-Cabinet Lining: 1/4-inch- (6-mm-) thick, polyethylene or polypropylene lining material.
- D. Glass for Glazed Doors: Clear laminated glass complying with ASTM C 1172, Kind LT, Condition A, Type I, Clas I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.
- E. Utility-Space Framing: Steel framing units consisting of two steel slotted channels complying with MFMA-4, not less than 1-5/8 inch (41 mm) square by 0.105 inch (2.7 mm) /12 gauge nominal thickness, and connected at top and bottom by U-shaped brackets made of 1/4 inch (6 mm) steel flat bars. Framing unit may be made by welding specified channel material into rectangular frames instead of using U-shaped brackets.
 - 1. Frame Spacing: Not to exceed 48 inches (1219 mm) on center.
 - 2. Provide supplemental framing members where indicated.

2.06 METAL CABINET AND TABLE FABRICATION

- A. Metal Cabinet Design: Flush overlay with square edges, except where required by manufacturer for special purpose cabinet types.
 - 1. Provide 1/8 inch (3.2 mm) reveals between adjacent doors and adjacent drawers, and between adjacent cabinets.
 - 2. At cabinet styles with fixed flush panels above or between cabinet doors, face of panel shall align with face of door.
- B. Metal Cabinet Design with Wood Door and Drawer Fronts: Flush overlay with square edges
 - 1. Provide 1/8 inch (3.2 mm) reveals between adjacent doors and adjacent drawers, and between adjacent cabinets.
 - 2. At cabinet styles with fixed flush panels above or between cabinet doors, face of panels shall align with face of door.

- C. Construction: Cabinet and table construction shall comply with SEFA 8M acceptance levels of physical performance test. Drawer cycle test shall comply with laboratory load 100 lbs. (45 kg) and heavy-duty laboratory load 150 lbs. (68 kg) acceptance level.
- D. Fabrication: Assemble and finish units at point of manufacture. Use precision dies for interchangeability of like-size drawers, doors, and similar parts. Perform assembly on precision jigs to provide units that are square. Reinforce units with angles, gussets, and channels. Except where otherwise specified, integrally frame and weld cabinet bodies to form dirt and vermin-resistant enclosures. Where applicable, reinforce base cabinets for sink support. Maintain uniform clearance around door and drawer fronts of 1/16 to 3/32 inch (1.5 to 2.4 mm).
 - 1. Cabinets, General:
 - a. Cabinet bodies shall be flush front construction with intersections of vertical and horizontal case members in same plane without overlap.
 - b. Cabinets 30 inches (762 mm) and wider with pair of swinging doors shall provide full access to complete interior without center vertical post.
 - c. Provide reinforcing at front and rear corners with full upright posts containing shelf adjustment holes, maximum 1/2- inch (13 mm) on center.
 - d. Provide floor mounted cabinets with leveler screws and integral bottom flange at each corner, accessed through openings in toe-space or cabinet bottom; plug openings.
 - 2. Base Cabinets:
 - a. Provide base cabinets with removable backs for access to utility space. Removable backs are not required at suspended cabinets, cabinets with security panels and where countertop depth is less than 30 inches (762 mm).
 - b. Provide sink base cabinets with partial height back panels to accommodate large sinks.
 - c. Provide intermediate rails between drawers and doors, and between drawers with security panels.
 - d. Intermediate rails shall be removable to allow modification to cabinet configuration in future.
 - e. Base cabinet assemblies without cabinet bottom separating interior of cabinet from toe-space are not acceptable.
 - 3. Tall Cabinets: Provide with toe-space, unless otherwise indicated.
- E. Flush Doors: Outer and inner pans that nest into box formation, with full-height channel reinforcements at center of door. Fill doors with noncombustible, sound deadening material.
- F. Hinged Doors: Mortise for hinges and reinforce with angles welded inside inner pans at hinge edge. Doors shall close against rubber bumpers.
- G. Glazed Doors: Hollow-metal stiles and rails of similar construction as flush doors, with glass held in resilient channels or gasket material.
- H. Drawers: Fronts made from outer and inner pans that nest into box formation, with no raw metal edges at top. Sides, back, and bottom fabricated in one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal. Drawers shall close against rubber bumpers.
- I. Wood Door and Drawer Fronts:
 - 1. Wood Door and Drawer Front Construction: Comply with SEFA 8W physical performance acceptance levels.
 - a. Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
 - b. Solid Wood: Clear hardwood lumber of species indicated, selected for compatible grain and color.

- c. Plywood: Hardwood plywood with face veneer of species indicated, selected for compatible color and grain. Grade A exposed faces at least 1/50 inch (0.5mm) thick, and Grade J crossbands. Provide backs of same species as faces.
- 2. Flush Doors and Flush Panels: 3/4 inch (19 mm) thick, with particleboard or MDF cores, and hardwood face veneers and crossbands.
- 3. Stile and Rail Glazed Doors: 3/4-inch- (19-mm-) thick, solid hardwood; mitered joints, machined to accept glass and removable interior glazing stops.
- 4. Drawers: Fronts made from 3/4-inch- (19-mm-) thick, hardwood plywood or solid hardwood. Sub-fronts, sides, back, and bottom fabricated in one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal.
- 5. Grain Direction: Vertical on both doors and drawer fronts, with continuous vertical matching.
- 6. Veneer Matching: Provide veneers for each cabinet from a single flitch, **book matched**.
 - a. Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
 - b. At cathedral grain, the crown shall be pointing up and run in the same direction for the entire project.
- 7. Edgebanding for Wood-Veneered Construction: Minimum 1/8-inch (3-mm) thick, solid wood of same species as face veneer.
- J. Adjustable Shelves: Front, back, and ends formed down, with edges returned horizontally at front and back to form reinforcing channels.
 - 1. Shelves to be adjustable at 1/2 inch (13 mm) centers.
 - 2. Reinforce shelves over 36 inches (914 mm) long with welded hat channel full length of shelf.
 - 3. Front edge of shelf to be within 1 inch (25 mm) of inside face of door.
 - 4. Cabinet Shelf Lip: Provide at cabinets without doors; steel angle 0.0478 inch (1.2 mm) / 18 gauge thick, horizontal leg attached to bottom front edge of shelf; top of vertical leg extending 1 inch (25 mm) above top of shelf.
- K. Toe Space: Fully enclosed, nominal 4 inches (100 mm) high by 3 inches (75 mm) deep, with no open gaps or pockets.
- L. Apron Leg and Table Assemblies: Welded tubing legs, not less than 2 inches (50 mm) square with channel aprons/frames, reinforcing cross-rails, and stretchers, unless otherwise indicated. Legs welded or bolted to apron/frame with heavy-duty corner brackets; weld or bolt reinforcing cross-rails to front and back apron/frame, unless otherwise indicated. Weld or bolt stretchers to legs and cross-stretchers, unless otherwise indicated. Provide threaded leveling device insert welded to bottom of each leg, unless otherwise indicated.
 - 1. Leveling Devices: Adjustable height type with nylon glides; minimum 1 inch (25 mm) diameter with minimum 5/8 inch (16 mm) height adjustment.
 - 2. Leg Shoes: 2-1/2 inch (64 mm) high, black vinyl or rubber, open-bottom, slip-on-type. Leg shoe shall be adjustable to conceal leveling devices and hold-down clips. Provide leg shoe where hold-down clips are indicated.
 - 3. Hold-Down Clips: Manufacturer's standard clip for anchoring table legs to floor.
 - a. Provide hold-down clips at apron leg assemblies integrated with other fixed casework assemblies.
 - b. Provide hold-down clips where tables are indicated to be fixed in place.
 - 4. Adjustable Height Tables: Provide four-leg adjustable height tables where indicated; tube within tube design with 1 inch (25 mm) increment adjustment capability. Height adjustment range from nominal 30 inches (762 mm) to 40 inches (1016 mm).

5. Fully Welded Tables: Provide fully welded table assemblies (legs, aprons, leg rails and stretchers) where indicated in Drawings. Provide hanging rail where suspended cabinets are indicated.
6. Mobile Tables: Provide caster type indicated on Drawings, in lieu of leveling devices.
7. Table Load Ratings: Live load, including the weight of the work surface, evenly distributed per SEFA 8M. Table load rating is in addition to the weight of the table assembly.
 - a. Free-Standing Tables and Mobile Tables with Combination Leveling Casters: Not less than 600 lbs (272 kg).
 - b. Mobile Tables with Casters: Not less than 300 lbs (136 kg).
 - c. Fixed Tables: not less than 2,000 lbs (907 kg).
- M. Utilities: Provide space, cutouts, and holes for pipes, conduits, and fittings in cabinet bodies to accommodate utility services and their support-strut assemblies. Grind edges and radius corners to eliminate sharp edges.
- N. Filler and Closure Panels: Provide where indicated and as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as adjacent exposed cabinet surfaces unless otherwise indicated.
 1. Provide fixed and removable panels at knee-spaces; incorporate electrical and data service fittings in fixed portion of knee-space panels.
 2. Provide closure panels at utility spaces where utility space would otherwise be exposed to view.
 3. Provide removable finished back panels where back of utility space is exposed to view; conceal fasteners.
 4. Provide hinged access panel for access to utility space where indicated.
- O. Security/Dust Panels: Provide 1/4 inch (6.4 mm) plywood or tempered hardboard above compartments and drawers with locks keyed differently, unless located directly under tops.
- P. Mobile Cabinets:
 1. Cabinet Design: Match metal cabinet with wood door and drawer front design.
 2. Cabinet Construction: Construct cabinets without toe space; reinforce bottom of cabinets; full cabinet top; finish cabinet four sides and top.
 - a. Leveling Devices: Provide four adjustable height type per cabinet with non-marring, non-metallic glides where indicated.
 - b. Casters: Provide casters at cabinet types indicated; front casters swivel/locking type, rear casters fixed type.
 - c. Anti-Tipping Mechanism: Unit with drawers shall be equipped with counterbalance weight to avoid tipping. Units with more than one drawer shall be equipped with interlocking drawer system to limit one drawer in vertical stack to be opened at one time.
 3. Work Surface: As indicated on Drawings.
- Q. Custom and Specialty Cabinets: As indicated on Drawings; provide associated specialty components and hardware.

2.07 SPECIAL PURPOSE CABINET FABRICATION

- A. Under-Counter Corrosives Storage Cabinets:
 1. Cabinet Material and Design: Metal laboratory casework with inset doors.
 2. Cabinet Construction: Comply with requirements for metal laboratory casework and the following:
 - a. Cabinet Use: Storage of acids and bases, where indicated on Drawings.

- b. Cabinet Lining: Chemical resistant polyethylene lining, top, bottom, sides, back, and inside of cabinet doors; minimum 1 inch (25 mm) high lip at front cabinet opening; cabinet lining shall be liquid tight to minimum depth of 1 inch (25 mm).
 3. Cabinet Door Hardware: Hinged doors with pulls, keyed lock and catches; fasteners, shelf supports and other exposed hardware items within cabinet shall be corrosion resistant materials, compatible with materials being stored.
 4. Cabinet Back: Provide removable back panels for access to utility chase from inside cabinet.
 5. Shelves: Provide one full-depth shelf with polyethylene or polyolefin spill tray with 1 inch (25 mm) high raised lip four sides of each shelf.
 6. Cabinet Ventilation: Provide 2 inch (50 mm) diameter polypropylene or polyolefin threaded vent pipe outlet(s) with sealed pipe joints. Secure vent outlets to back of cabinet with locking nut and seal to back panel. PVC piping is not acceptable.
 - a. Cabinets Ventilated Through Fume Hoods: Provide 2 inch (50 mm) diameter polyethylene or polyolefin vent pipe up to rear of fume hood located above cabinet. Coordinate pipe opening size and location in fume hood work top with Division 11 Section "Laboratory Fume Hood." Extend vent pipe assembly 4 inch (102 mm) above fume hood work top and behind rear baffle.
 - 1) Mechanically ventilate cabinets where indicated on Drawings. Connect laboratory exhaust system duct to vent pipe outlet(s) at back of cabinet; refer to Division 23 sections for duct connections, including duct.
 7. Identification: Storage cabinet shall be identified with conspicuous, minimum 2 inch (50 mm) high capital lettering to identify the material being stored (e.g. CORROSIVES-ACIDS, CORROSIVES-BASES, and other materials as indicated on Drawings).
- B. Under-counter Flammable Liquid (Solvent) and Hazardous Material Storage Cabinets:
 1. Cabinet Material and Design: Metal laboratory casework with inset doors.
 2. Cabinet Construction – Flammable Liquid Storage Cabinets: Steel construction comply with requirements of NFPA-30, with chemical resistant, baked-on powder coat finish exterior and interior. Equip cabinet with adjustable leveling feet and grounding connector. Bottom sump shall be liquid tight to height of 2 inches (50 mm).
 - a. Labeling: Provide units that are listed and labeled as complying with requirements of NFPA 30 by Underwriters Laboratory (UL) or other testing and inspecting agency acceptable to authorities having jurisdiction. Cabinets shall be FM Global approved. Provide testing laboratory labels on top interior of cabinet doors.
 3. Cabinet Construction – Hazardous Material Storage Cabinets: Steel construction with chemical resistant, baked-on powder coat finish exterior and interior. Equip cabinet with adjustable leveling feet and ground connector. Bottom sump shall be liquid tight to height of 2 inches (50 mm). Cabinet construction shall either be listed in accordance with UL 1275 as suitable for intended storage or constructed in accordance with the following:
 - a. Minimum 0.0478 inch (1.2 mm) / 18 gauge sheet steel, double-walled, including doors, with 1.5 inch (38 mm) airspace between walls. Joints shall be riveted or welded and shall be tight fitting.
 - b. Labeling: Provide units that are listed and labeled by Underwriters Laboratory (UL) or other testing and inspecting agency acceptable to authorities having jurisdiction. Cabinet shall be FM Global approved. Provide testing laboratory labels on top interior of cabinet door.
 4. Cabinet Door Hardware: Hinged doors with piano hinges; self-closing with fusible link and coordinator; self-latching with 3-point latch arrangement; keyed lock with padlock eye.

5. Cabinet Back Option: Provide units with removable back where standard to manufacturer's listed and labeled products.
6. Shelves: One, full-depth shelf; adjustable where standard to manufacturer's listed and labeled products.
 - a. Hazardous Material Storage Cabinet Sump and Shelves: Equip cabinet sump and shelves with polyethylene spill trays, liquid tight with 1 inch (25 mm) high raised lip four sides.
7. Identification – Flammable Liquid Storage Cabinets: Cabinets shall be identified with conspicuous, minimum 2 inch (50 mm) high capital lettering to read "FLAMMABLE KEEP FIRE AWAY" in color contrasting with the cabinet finish color.

2.08 SHELVING

- A. Wall Rail System: Manufacturer's modular integrated system that includes support structure and cantilevered storage components mounted to building partitions.
 1. System Assembly: Wall mounted rail systems with cantilevered storage components as indicated on Drawings.
 - a. Structural components consisting of vertical and horizontal rails anchored to building partitions.
 - 1) Vertical Rails: Cold rolled steel channels, slotted for 1 inch (25 mm) adjustment of components; attached to horizontal rails and anchored to partition at 12 inches (300 mm) on-center, maximum. End vertical rails single or double slotted; intermediate vertical rails double slotted.
 - 2) Horizontal Rails: Cold rolled steel channels, slotted for 6 inch (150 mm) adjustment of vertical rails; anchored to partition at 12 inches (300 mm) on-center, maximum.
 - 3) Horizontal Rail Covers: Cold rolled steel channel inserts, fastened to horizontal rails, between vertical rails.
 - b. Module Size and Configuration: As indicated on Drawings.
 - c. Fasteners: Type required by manufacturer for materials and assemblies being fastened.
 - d. Shelving Units: Shelving material, number, size, and configuration as indicated on Drawings.
 - e. Insert Panels: Steel panels with mounting brackets and hardware, as indicated on Drawings.
 - f. Load Capacity: 760 lbs (345 kg) total load rating.
- B. Wood Shelving Units: 1-inch- (25-mm-) thick veneer-core hardwood plywood core.
 1. Material, Construction and Finish: 1" veneer core plywood with 1/8" hardwood edge-banding at front and side edges. Provide with rear retaining lip 1/2 inch thick by 2 inch high, solid hardwood attached to rear edge of shelving. Top shelf assemblies do not require retaining lip and shall have 1/8" hardwood edge-banding. Match wood front metal casework.
 2. Shelf Brackets: Cold rolled steel, bookend type with up-turned bracket fastened to shelf to form integral unit; provide down-turned bracket for inverted top shelf where indicated on Drawings. Shelf bracket hooks to be compatible with slotted support system of bench-top upright system, wall rail system, mobile carts, and other casework systems; 1 inch (25 mm) adjustment.

2.09 ADAPTABLE LABORATORY CASEWORK SYSTEMS

- A. Laboratory Casework System Design: Provide casework manufacturer's modular integrated adaptable laboratory casework systems of the types indicated, that include support framing systems, modular suspended and floor standing cabinets, fillers and closure panels, service columns, service pedestals and raceways, modular and continuous countertops, and other system components as indicated. System includes hardware fittings and fasteners necessary for securing fixed support framing to permanent building construction.
 - 1. Moveable (free standing) workstations.
- B. Cabinet Construction: As indicated for metal with wood drawer and door fronts laboratory casework.
 - 1. Suspended cabinets shall be capable of being removed and reinstalled without use of special tools for relocation within system.
 - 2. Suspended base cabinets shall be capable of being removed without providing temporary support for or removing countertops.
 - 3. Sinks shall be supported independent of suspended base cabinets.
 - 4. System includes filler and closure panels to close spaces between support framing, cabinets, shelves, countertops, floors, and walls, unless otherwise indicated. Fabricate panels from same material and with same finish as cabinets.
- C. Shelving Units: Material, size and configuration as indicated on Drawings. Refer to "Shelving" Article.
- D. Moveable Workstations (Free Standing): Manufacturer's modular, integrated self-supporting movable workstations comprised of work surface support frames and rear frame support structure incorporating a vertical post and horizontal support. The vertical supports shall incorporate individual slots for adjustable shelving and accessories, and chase for piping and wiring of services, including pre-wiring and pre-piping of services within the workstation.
 - 1. Workstation size and configuration as indicated on Drawings.
 - 2. Worksurface Support Frames: Welded frame assembly consisting of 11-gauge steel channels, front adjustable legs, and rear attachment collars.
 - a. Height adjustable in 1 inch (25 mm) increments from nominal 31- to 37- inch (787- to 940- mm) inches above finish floor.
 - b. Front leg members shall be 11-gauge steel tubes, 2 inch (50 mm) outside diameter and 1.75 inch (44 mm) inner telescoping leg capable of vertical adjustment in 1 inch (25 mm) increments. Legs to be equipped with non-marring adjustable height type leveling devices.
 - c. Rear corners shall be 2.25 inch (57 mm) diameter by 6 inch (152 mm) high, 11-gauge half-round collars welded to the worksurface frame with supporting gussets and shall be mechanically fastened to the rear upright supports with button head socket cap screws.
 - d. Load Rating: SEFA Work Surface Load Category-4, 1200 lbs (544 kg) for frames up to 72 inch (1829 mm) wide and Category-3, 1000 lbs (454 kg) for frames over 72 inch (1829 mm) wide. Uniformly distributed load, 0.125 inch (3 mm) maximum allowable deflection measured at center of front rail.
 - e. Worksurface: As indicated on Drawings.
 - f. Accessories.
 - 1) Cabinet Stop: Provide full width horizontal rear cabinet stop located under work surface frame to position 22 inch (559 mm)

- deep mobile base cabinets 1 inch (25 mm) behind the front edge of the work surface, where mobile cabinets are indicated on Drawings.
- 2) Cabinet Hanging Rail: Provide cabinet hanging rail at rear of worksurface support frame where suspended cabinets where indicated on Drawings.
 - 3) Free-Standing Work Top Frames: Work surface support frame as indicated above, with two rear adjustable height leg members bolted to the rear attachment collars to form a four-leg self-supporting table frame. Legs to be equipped with non-marring, adjustable height type leveling device. Size and configuration as indicated on Drawings.
3. Rear Frame Support Structure Type-B (Double-Sided): Welded rear frame support structure shall be nominal 84 inch (2135 mm) high and allow worksurface support frame to be mounted on both sides.
- a. Rear Frame Support Structure: Four (4), 2-inch (50-mm) diameter tube full height vertical members, connected with a horizontal frame assembly that incorporates upper and lower horizontal cross rails. The upper cross rail shall provide a utility trough the full length of the frame. The lower cross rail shall support integral double sided electrical and central plumbing raceway, with plumbing, electrical and data devices as indicated on Drawings. Plumbing lines and wiring shall feed through separate compartments of the vertical members and horizontal raceway. Provide the vertical members and lower horizontal member with easily removable access panels with no exposed fasteners. Each rear frame member to be equipped with non-marring, adjustable height type leveling devices.
 - b. The lower cross rail and the 2-inch (50-mm) diameter vertical members shall be able to accommodate up to three piped services each and a duplex electrical receptacle located below the work surface.
 - c. Provide extended vertical service chase where piped service outlets are located on vertical member(s) of rear frame support structure.
 - d. Rear frame support structure in widths of 60-inches (150-mm) and greater shall have a center vertical support to accommodate split shelving.
 - e. The vertical members shall have shelf/accessory slots punched on 1-inch (25-mm) centers on the to accept adjustable shelving; the lower section shall be bored and tapped at 1-inch (25-mm) centers for attachment of adjustable height worksurfaces frame.
 - f. Accessories:
 - 1) Adjustable shelving units where indicated on Drawings.
 - 2) Suspended upper cabinet units where indicated on Drawings.
 - 3) Post-Brackets: Provide post-brackets to connect 2-inch (50-mm) diameter frames and legs (side-to-side), where indicated on Drawings.
4. Pre-wire moveable workstations for electrical and data devices included with workstation.
- a. Electrical Service Fittings: Provide UL listed units with metal housings, accessories and gaskets required for mounting in workstations.
 - 1) Receptacles: Hospital grade, 120V, 20 amp, duplex type NEMA 5-20R; color as selected by Architect.
 - 2) Power Cord: Dual-circuit, 4 wire, 120V, 20 amp cord with twist-lock plug (NEMA L14-20). Cord length as required to reach ceiling service location.

- b. Data Service Fittings: Provide duplex style, RJ45 data receptacle metal housing, accessories and gaskets required for mounting in workstations, color as selected by Architect, where indicated on Drawings.
 - 1) Data Cabling: CAT 6 with RJ45 plug; cable length as required to reach ceiling service location.
 - 5. Pre-pipe moveable workstations for piped utility services included with workstation.
 - a. Rear Frame Support Structure Type-B2 (Double-Sided, Twin Post with Chase):
 - 1) Internal Service Hoses: 3/8-inch (10-mm) reinforced PVC with 3/8-inch (10-mm) female outlet escutcheon mounted in lower horizontal cross rail and 3/8-inch (10-mm) female inlet at top of post with keyed quick connect plug.
 - 2) Service Fittings: Manufacturer's standard double needle valve, panel/overhead mounted service outlet. Refer to "Water and Laboratory Gas Service Fittings" Article for finish and service identification.
 - 3) Extension Service Hoses: 3/8- inch (10- mm) reinforced PVC hose with keyed quick connect plug and body end fittings.
 - 6. Hose/Cord Wrap: Expandable polyethylene spiral wrap for bundling service lines and cords; expandable from 1- to 2-inch (25- to 50-mm) diameter. Provide separate wraps for hose services, power and data cords. Color as selected by Architect.

2.10 CEILING SERVICE PANELS

- A. Basis of Design Product as indicated on drawings, or approved equal by Metal Casework manufacturer.
 - 1. Flush service panel that integrates into ceiling grid and provides utilities to mobile workstations and equipment.
 - 2. See drawings for configurations and device color requirements.
 - 3. Provide auxiliary support as required, using seismic performance requirements and design criteria indicated.
 - a. Where width of ducts and other construction within ceiling plenum interfere with locations of service panel supports, design supplemental framing in form of trapeze or other assemblies to support service carrier.
 - 4. Pre-wiring: Service panels shall be furnished with cutouts, boxes, devices pre-wired to box(es) on the back side of the panel (accessible above the ceiling) and face plates installed. Refer to Division 20 Sections for wiring, conduit and box connectors.
 - 5. Color: White color family; as selected from Manufacturer's full range of colors.

2.11 METAL FINISH

- A. Prepare, treat and finish welded assemblies after assembling. Prepare, treat and finish, components that are assembled with mechanical fasteners before assembling. Prepare, treat and finish concealed surfaces same as exposed surfaces.
- B. Chemical-Resistant Finish: Laboratory casework manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 1.5 mil average and 1.2 mil minimum on exterior and interior surfaces exposed to view; 1.2 mil average on backs of cabinets and other surfaces not exposed to view.

1. Ends of cabinets, including those installed directly against walls or other cabinets are defined as “exposed.”
2. Chemical and Physical Resistance of Finish System: Finish shall comply with acceptance levels of cabinet surface finish tests in SEFA 8M. Acceptance level for chemical spot test shall be no more than four Level 3 conditions, and results shall be within the range indicated for each chemical reagent.
3. Colors for Metal Laboratory Casework Finish: White color family, final color to be selected by Architect from manufacturer's full range.

2.12 WOOD FINISH

- A. Preparation: Sand after assembling for uniform smoothness at least equivalent to that produced by 220-grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Staining: Remove fibers and dust and apply stain to exposed and semi-exposed surfaces as necessary to match approved Samples. Apply stain in a manner that will produce a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.
 1. Stain Color: As selected by Architect from manufacturer's full range.
- C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard three-coat, chemical-resistant, transparent finish. Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
 1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8W. Acceptance level for chemical spot test shall be no more than four Level 3 conditions, and within the range of results indicated for each chemical reagent.

2.13 HARDWARE

- A. General: Provide laboratory casework manufacturer's standard, commercial-quality, heavy-duty hardware complying with requirements indicated for each type, unless otherwise indicated.
- B. Pivot Hinges: Stainless steel complying with SEFA 8M.
- C. Hinged Door and Drawer Pulls: Provide back-mounted pulls with lock washers, unless otherwise indicated. Provide two pulls for drawers more than 24 inch (600 mm) wide. Mount drawer pulls horizontally, door pulls vertically. Basis of Design: Hafele Amerock Kontur Collection 133.50.706.
 1. Stainless-steel wire pulls, nominal 1 by 4-1/2 inches (25 by 114 mm).
- D. Hinged Door and Drawer Integral Pulls: Integral pulls per “Metal Cabinet and Table Fabrications” Article, unless otherwise indicated.
 1. At Special Purpose Cabinets, provide manufacturer’s standard latches and pulls for cabinet types indicated.
- E. Door Catches: Nylon-roller spring catches.
 1. Provide at cabinet doors, except where elbow catches are indicated.
 2. Base Cabinets: Attach to top of cabinet doors.
 3. Wall Cabinets: Attach to bottom of cabinet doors.
 4. Upper and Tall Cabinets: Attach at top and bottom of cabinet doors.
- F. Elbow Catches: Spring type, zinc plated steel, with strike of suitable design.
 1. Provide at left-hand door of cabinets with pair of doors and cabinet lock.
 2. Provide at fixed center shelf of left-hand door of tall cabinets with pair of doors and cabinet lock.

- G. Drawer Slides: Side/rail mounted, full extension slides; zinc plated steel with steel ball bearings, designed to prevent rebound when drawers are closed.
 - 1. Box Drawer and Pull-Out Shelves: Medium duty slides, minimum 100 lbs (45 kg) capacity.
 - 2. File Drawers: Heavy-duty slides, minimum 200 lbs (90 kg) capacity, with over-travel.
- H. Locks: Cam type with five-pin tumbler, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281 (metal and wood cabinets), E07111 or E07021 (metal cabinets).
 - 1. Provide a minimum of two keys per lock and two master keys.
 - 2. Provide where indicated.
 - 3. Keying: Key locks as directed by Owner.
 - 4. Master Key System: Key locks to be operable by master key[, except locks for flammable liquid and hazardous material storage cabinets].
- I. Grommets: Provide grommets through work surfaces and other locations where indicated on Drawings.
 - 1. Products: Subject to compliance with requirements, provide products by Doug Mocket & Company, Inc. or comparable products by laboratory casework manufacturer.
 - a. Round Plastic Grommet: Doug Mocket & Company, Inc.; Product – Round Plastic Grommet Sleeve, Model EDP3 – 2-1/2” Flip-Top Grommet Set, includes cap and liner.
 - 2. Finish Color: Black matte, as selected by Architect from manufacturer’s full range.
- J. Casters:
 - 1. Casters – Mobile Cabinets: Laboratory casework manufacturer’s standard dual nylon wheel stem casters, swivel/locking and fixed type as indicated.
- K. Workstation Brackets: Provide brackets between knee spaces where indicated on Drawings.
 - 1. Products: Subject to compliance with requirements, provide products by A&M Hardware, Inc. or comparable products by laboratory casework manufacturer.
 - a. Standard Bracket – Extra strong 1/8” steel, 24” x 29”.
 - b. Finish Color: White

2.14 LABORATORY WORK SURFACES

- A. Work Surfaces, General: Provide units with smooth surfaces in uniform plane, free of defects. Make exposed edges and corners straight and uniform. Provide front and end overhang of 1 inch (25 mm), with continuous drip groove on underside 1/2 inch (13 mm) from edge.
- B. Epoxy Countertops and Tabletops: Fabricate with factory cutouts for sinks, holes for service fittings and accessories, and with butt joints assembled with epoxy adhesive and concealed metal splines. Construction shall be uniform throughout full thickness.
 - 1. Top Configuration: Flat, 1 inch (25 mm) thick, with beveled edge and corners, and with drip groove on under-side 1/2 inch (13 mm).
 - a. Provide tops with raised (marine) edge where indicated Drawings; 1-1/4 inch (32 mm) thick at raised edge; 1 inch (25 mm) minimum thickness of top, with integral or applied raised edge having beveled edge and corners.
 - b. Provide drain-board grooves in countertops adjoining sinks, where indicated on Drawings
 - c. Other top configurations as indicated on Drawings.
 - 2. Curbs: Supply loose for field installation in same thickness as top. Configuration as indicated on Drawings.
 - a. Height: 4 inch (102 mm) high, unless otherwise indicated on Drawings.
 - b. Provide where tops abut partitions, fume hoods, and other adjoining above counter elements.

- c. Other curb conditions as indicated on Drawings.

2.15 LABORATORY SINKS

- A. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
 - 1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2 (DN 40), unless otherwise indicated.
 - 2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches (50 mm) less than sink depth. Provide in same material as strainer.
- B. Epoxy Sinks:
 - 1. Sink Fabrication: Molded in one piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch (13-mm) minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.
 - b. Provide integral sinks in epoxy countertops, where indicated, bonded to countertops with invisible joint line.
 - c. Provide manufacturer's recommended adjustable support system for table- and cabinet-type installations.
 - d.
- C. Cup Sinks: Material and size as indicated on Drawings.
 - 1. Provide epoxy cup sinks with polypropylene strainers and integral tailpieces.

2.16 CASEWORK ACCESSORIES

- A. Pegboards (Drying Racks):
 - 1. Epoxy Pegboards: Units with removable pegs, drip trough and accessories.
 - a. Pegboard Size: As indicated on Drawings.
 - b. Pegs: Removable, white polypropylene pegs, minimum 6 inch (50 mm) peg length unless otherwise indicated; peg quantity per manufacturer's standard for pegboard size indicated.
 - c. Drip Trough: Stainless steel drip trough mounted to bottom of pegboard; width of pegboard by 4 inch (50 mm) deep by 1 inch (25 mm) high, with drain grid, drain outlet, and 24 inch (75 mm) clear flexible plastic drain hose.
 - d. Mounting Assembly: Provide stainless steel, counter-sunk, allen-head fasteners for attachment to umbilical.
- B. Umbilicals:
 - 1. Metal Umbilical: Fabricate umbilical from minimum 0.0478 inch (1.2 mm) /18 gauge sheet metal to form vertical service chase from work surface up through ceiling. Umbilical shall have removable sections for easy access to utility services. Removable panel shall not disturb ceiling or work surface.
 - a. Removable Panel: Equip removable front panel with three Z-hanger each side for lift-off attachment to fixed side panels. Reinforce front face with hat-channels for stiffness.
 - b. Fixed Panels: Fabricate wall conditions with C-shape end panels; fabricate island/peninsula conditions with one-piece ends and back. Equip front return leg of panel with slotted opening to receive Z-hangers of removable panel. Provide

- horizontal slot-channel pipe supports (7/8 inch (22 mm) deep max.) at back for support of utilities.
- c. Ceiling Collar: Equip umbilical with ceiling collar that projects up through ceiling. At wall conditions, anchor collar to partition; at island/peninsula conditions, suspend collar from structure above. Do not rely on ceiling for support or bracing.
- C. Under-Cabinet Light: LED task light fixture with on/off rocker switch and grounded power cord; UL listed.
- 1. Products: Subject to compliance with requirements, provide PG LifeLink products indicated on Drawings or comparable products by laboratory casework manufacturer.
 - 2. Housing: Extruded aluminum.
 - 3. Finish: Satin anodized finish.
 - 4. Size: As indicated on Drawings.
 - 5. Diffuser: Clear, non-yellowing polycarbonate.
 - 6. Lamps: White LED lamps.
 - 7. Light Output: Minimum 40 foot-candles at 21-1/2 inch (546 mm) height above work surface; 150 lumens per foot.
 - 8. Color Temperature: ANSI C3.
 - 9. Environment: Indoor, dry location.
 - 10. Fixture Mounting: Mechanically attached to wood cabinets and shelves; magnetic strip attachment to metal cabinets and shelves.
 - 11. Electrical Service: Equip individual and daisy-chain start units with grounded cord and plug; 120V service. Provide power connections at both ends of fixture to allow for daisy chaining; provide cords to connect daisy chained units.
 - a. Individual Units: Provide where UCL indicated at an individual wall cabinet or shelving unit (no adjoining UCL indicated).
 - b. Daisy-Chain Units: Provide where UCL indicated at adjoining wall cabinets and shelving units (side-by-side units).

2.17 WATER AND LABORATORY GAS SERVICE FITTINGS

- A. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures - Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
 - 1. Provide units that comply with "Vandal-Resistant Faucets and Fixtures" recommendations in SEFA 7.
- B. Materials: Fabricated from cast or forged red brass unless otherwise indicated.
 - 1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
- C. Finish - General: Polished chromium plated finish with baked-on clear epoxy coating, unless otherwise indicated.
 - 1. Remote-Control Fume Hood Outlets: Provide acid- and solvent-resistant powder coating complying with requirements in SEFA 7 for corrosion-resistant finishes for fume hood remote control outlets. Color code outlets to identify service or media delivered.
- D. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig (550 kPa).
 - 1. Vacuum Breakers: Provide ASSE 1035 or 1001 vacuum breakers, as required by authorities having jurisdiction, for potable water fittings.

2. Aerators and Serrated Hose Outlets: Provide aerators and serrated hose outlets for water fittings, as indicated on Drawings. Turn over un-used aerators and serrated hose outlets to Owner.
3. Renewable Seat/Unit: Provide compression valve design with an integral adjustable volume control device. Unit shall be capable of converting from compression to self-closing control without disturbing the faucet body.
 - a. Volume Control Setting: Verify setting with Owner
4. Self-Closing Valves: Provide self-closing valves where indicated.
- E. Needle Valves: Provide units with renewable, self-centering, floating cones and renewable seats of stainless steel or Monel metal.
 1. Needle Valves: Provide units designed for working pressure up to 125 psig (860 kPa).
 2. Fine Control Needle Valves: Provide units designed for working pressure up to 250 psig (860 kPa).
 3. Outlets: As indicated on Drawings.
- F. Pressure Regulators: Where indicated.
 1. Type: Non-relieving type with brass body and neoprene diaphragm.
 2. Inlet Pressure Range: 5 to 300 psig (34 to 2068 kPa).
 3. Outlet Pressure Range: 5 to 125 psig (34 to 860 kPa).
 4. Outlets: As indicated on Drawings.
- G. High Purity Gas Service Fitting Cleaning: Fittings for Carbone Dioxide, Helium, Hydrogen, Nitrogen and Oxygen services shall be cleaned, degreased and packed for high purity gas service; minimum 99.5% purity, medical quality minimum.
- H. Hand of Fittings: Furnish right-hand fittings unless fitting designation is followed by "L."
- I. Remote-Control Valves: Provide water, ball and needle valves, straight-through or angle type as indicated for fume hoods and where indicated.
- J. Handles: Provide three- or four-arm, forged-brass handles for valves unless otherwise indicated.
 1. Provide blade handles at water faucets, unless otherwise indicated.
 2. Provide lever-type handles for ball valves unless otherwise indicated. Lever handle aligns with outlet when valve is fully open and is perpendicular to outlet when valve is closed.
 3. Provide knurled, molded-plastic handles for needle valves.
- K. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant. Comply with SEFA 7 for colors and embossed identification.
 1. Where color coded handles are indicated, provide neutral colored disk with contrasting color embossed identification.
- L. Safety Fittings:
 1. Comply with requirements of ANSI Z358.1
 2. Safety Shower Units: Refer to Division 22 section.
 3. Drench Hose and Eye/Face Wash Units: Spray-type heads to deliver soft, wide, high-volume spray of water, integral self-regulating flow control, reticulated polyurethane filter, threaded spray cover and hinged swing-away dust cover.
 4. Utility Services: Refer to Division 22 sections for supply and waste piping, tempered water mixing valves, flow switches and connections to building automation system or alarm as indicated.
 5. Safety Fitting Signage: Provide ANSI-compliant identification signs at safety fittings.

2.18 ELECTRICAL AND COMMUNICATION SERVICE FITTINGS

- A. Service Fittings, General: Metal housings, conduits, wiring, receptacles, switches, pilot lights, voice and data communication outlets, cover plates, accessories, and gaskets required for mounting on laboratory casework are specified in Division 26 and 27 sections.
 - 1. Electrical and Communication Device Colors: Refer to Division 26 and 27 sections.
 - 2. Cover Plates: Provide satin finish, Type 304, stainless-steel cover plates with formed, beveled edges.
 - 3. Cover Plate Identification: Use 1/4-inch- (6-mm-) high letters unless otherwise indicated. For stainless steel or chrome-plated metal, stamp or etch plate and fill in letters with black enamel. Refer to Division 26 and 27 sections location and information content.
- B. Pedestal-Type Fittings: Cast-aluminum housings with sloped single face or two faces, as indicated, with neoprene gasket under base and with concealed mounting holes in base for attaching to laboratory casework. Provide holes tapped for conduits.
 - 1. Finish: Satin aluminum with baked-on clear epoxy coating, unless otherwise indicated.

PART 3 - EXECUTION

3.01 INSTALLATION OF CABINETS

- A. Comply with installation requirements in SEFA 2. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm). Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Utility-Space Framing: Secure to floor with two fasteners at each frame. Fasten to partition framing, wood blocking, or metal reinforcements in partitions and to base cabinets.
- C. Base Cabinets: Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions, with fasteners spaced not more than 16 inches (400 mm) o.c. Bolt adjacent cabinets together with joints flush, tight, and uniform.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches (600 mm) o.c. and at sides of cabinets with not less than two fasteners per side.
- D. Wall Cabinets: Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 16 inches (400 mm) o.c.
- E. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- F. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
- G. Install movable laboratory cabinets, tables and mobile carts where indicated.

3.02 INSTALLATION OF WORK SURFACES

- A. Comply with installation requirements in SEFA 2. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.

- B. Field Jointing: Where possible, make in same manner as shop-made joints using dowels, splines, fasteners, adhesives, and sealants recommended by manufacturer. Shop prepare edges for field-made joints.
- C. Fastening:
 - 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 - 2. Secure countertops to cabinets with countertop manufacturer recommended bonding material, applied at each corner and along perimeter edges at not more than 48 inches (1200 mm) o.c.
 - 3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch (3 mm) and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
 - 4. Provide utility space framing, wood blocking, cleats, or other reinforcement to support edge of countertops at adjoining construction.
- D. Provide scribe moldings for closures at junctures of countertop, curb, and splash with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
 - 1. Apply sealant at joints between countertops, curbs, and splash, and adjoining walls. Comply with Division 07 Section "Joint Sealants."
- E. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.03 INSTALLATION OF SINKS

- A. Comply with installation requirements in SEFA 2.
- B. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive, and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement.
- C. Drop-in Installation of Epoxy Cup Sinks: Rout groove in countertop to receive sink rim if not shop prepared. Set sink in adhesive and fill remainder of groove with sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers.

3.04 INSTALLATION OF CASEWORK ACCESSORIES

- A. Install accessories according to Shop Drawings, installation requirements in SEFA 2, and manufacturer's written instructions.
- B. Securely fasten adjustable shelving supports, shelves, and pegboards to partition framing, wood blocking, or reinforcements in partitions.
- C. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.
- D. Securely fasten pegboards to partition framing, wood blocking, or reinforcements in partitions.
- E. Securely fasten umbilical assemblies to work surface curbs and above ceiling supports, straight and plumb, closely fitting to other work where indicated.

3.05 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in other Sections for installing water and laboratory gas service fittings and electrical devices.
- B. Install fittings according to Shop Drawings, installation requirements in SEFA 2, and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings to laboratory casework unless otherwise indicated.

3.06 INSTALLATION OF ADAPTABLE LABORATORY CASEWORK SYSTEMS

- A. Install adaptable laboratory casework systems according to Shop Drawings and manufacturer's written instructions. Install level, plumb and true.
- B. Securely fasten countertop, floor and wall mounted items to supporting construction, partition framing, wood blocking, or reinforcements in partitions.

3.07 INSTALLATION OF CEILING SERVICE PANELS

- A. Install ceiling service panels according to Shop Drawings and manufacturer's written instructions. Install level, plumb and true.

3.08 CLEANING AND PROTECTING

- A. Clean finished surfaces touch up as required and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches (1200 mm) o.c.

END OF SECTION



SCHEDULE OF SUBMITTALS	
PROJECT NO.: 46121-C	
FACILITY: NY PSYCHIATRIC INSITUTE	
CONTRACTOR: -	
PROJECT MANAGER: MARK HOUGHTALING	
DESIGN CONSULTANT: URBANH ARCHITECTS	
ENGINEER-IN-CHARGE:	
<p style="text-align: center;">LEGEND</p> <p>PACK: SUBMITTAL PACKAGE</p> <p>SD: SHOP DRAWINGS</p> <p>PD: PRODUCT DATA</p> <p>SAM: SAMPLES</p> <p>QCS: QUALITY CONTROL SUBMITTALS</p> <p>LEED: LEED SUBMITTALS</p> <p>CCS: CONTRACT CLOSEOUT SUBMITTALS</p> <p>EPD: ENVIRONMENTAL PRODUCT DECLARATION</p> <p><u>SUBMITTAL REVIEW RESPONSIBILITY:</u></p> <p>F: OGS FIELD OFFICE</p> <p>F/O: OGS FIELD OFFICE / OFFICE (ALBANY)</p> <p>D: CONSULTANT / DESIGNER</p> <p>S: OGS SCHEDULING DEPARTMENT</p> <p>RSM: Regional Safety Manager</p>	<p style="text-align: center;"><u>INSTRUCTIONS TO THE CONTRACTOR</u></p> <p>1. Refer to Section 013300 Submittals of the Project Manual for general requirements regarding submittals and to Section 017716 - CONTRACT CLOSEOUT for project closeout submittals.</p> <p>2. Refer to Sections of the specifications indicated herein for details of the requirements for each submittal listed.</p> <p>3. Indicate in the rows (spaces) following each item:</p> <p style="margin-left: 20px;">a. Critical submittals and long lead items (mark with an 'X').</p> <p>Some critical submittals may already be identified by the design team. Confirm that these are critical submittals.</p> <p style="margin-left: 20px;">b. The date the item will be submitted, and date approval is required (allow at least 3 weeks), and the date delivery of the material or equipment is necessary for completion of the work in accordance with the Progress Schedule. The date entered for the submittal is the last date a substitution will be considered. Proposed substitutions must be made prior to the date entered if more than one substitution is to be submitted for approval. Spaces which contain N/A do not require dates.</p> <p>4. An example of a Submittal Transmittal (BDC-42) can be located at: http://www.ogs.ny.gov/BU/DC/forms/ContractorConstForms.asp</p> <p>5. Submit Contract Closeout Submittals (CCS) prior to final inspection.</p> <p style="text-align: center;"><u>INSTRUCTIONS TO THE CONSULTANT / DESIGNER</u></p> <p>1. Cut and paste required information from each Division (Div.X) tab and place in the S.O.S. tab.</p> <p>2. Delete Division (Div.X) tabs after the S.O.S. tab has been in-filled.</p> <p>3. Indicate F, F/O or D in column E. Items in Div.1 have defaults that can be modified as necessary.</p> <p>4. Indicate items that are critical submittals in column F.</p> <p><u>Note:</u></p> <p>The following list of submittals is furnished for your convenience in scheduling submittals. The list is not warranted to be complete and does not take precedence over the contract documents. Enter additional submittals, as required and modify this schedule to the specific project. This S.O.S. will be used to populate the submittals website log.</p>



SCHEDULE OF SUBMITTALS

PROJECT NO.: 46121-C

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 4 weeks for Approval (allows time for any resubmission)		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
007213			GENERAL CONDITIONS					
007213		PD	ARTICLE 6: Designate in writing competent supervision and/or management representatives as required - include contact number in case of an emergency after work hours, including weekends and holidays (see 011000 Summary of Work)	F				
007213		PD	ARTICLE 8: Permits and licenses	F				
011100			SAFETY					
011100	1.04(A)	QCS	Site Specific Safety Plan	RSM				
011100	1.04(B)	QCS	Employee Safety Orientation Training and Certificates	F				
011100	1.04(C)	QCS	Accident Reporting	F				
013300			SUBMITTALS					
013300	1.07(B)	PD	Schedule of Submittals (This form completed and edited)	F	X			
013300	1.07(A)	QCS	Submittal Coordinator Qualifications	F/O	X			
016500			MATERIALS AND EQUIPMENT					
016500	1.02(A)	PD	Product Labels: When materials or equipment are specified to conform to ASTM, Federal or other reference specifications, the materials delivered to the site shall bear the manufacturer's printed labels stating that the materials meet the requirements of such referenced specifications.	F				
016500	1.03(A)	PD	Deliver factory packaged materials and equipment in the manufacturer's original containers	F				
017716			CONTRACT CLOSEOUT					
017716	1.04	CCS	Project Record Documents	F				
017716	1.05	CCS	Operation and maintenance, 2 copies	F				
017716	1.06	CCS	Warranties	F				
017716	1.07	CCS	Spare Parts and Maintenance Materials	F				
028213			ASBESTOS ABATEMENT					
028213	1.07 (A)	PD	Disposal Bags	D				
028213	1.07 (A)	PD	Negative Air Pressure Units	D				
028213	1.07 (A)	PD	HEPA Filters (Negative Air Pressure Units)	D				
028213	1.07 (A)	PD	HEPA Filters (Respirators)	D				

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PROJECT NO.: 46121-C

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 4 weeks for Approval (allows time for any resubmission)		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
028213	1.07 (A)	PD	HEPA Filters (Vacuum Cleaners)	D				
028213	1.07 (A)	PD	Respirators	D				
028213	1.07 (A)	PD	Vacuum Cleaners	D				
028213	1.07 (A)	PD	Equipment - Temporary lighting, heating, hot water heating units, ground fault interrupters, and all other equipment on site shall be UL listed.	D				
028213	1.07 (A)	PD	Equipment - All electrical equipment shall be in compliance with the National Electric Code, Article 305 - Temporary Wiring.	D				
028213	1.07 (B) (1)	QCS	Asbestos Site Specific Variance Submittals; if a site specific variance is sought submit the following: One copy of the completed DOSH-751 and DOSH-465 forms	D	X			
028213	1.07 (B) (2)	QCS	Asbestos Site Specific Variance Submittals; if a site specific variance is sought submit the following: One copy of the New York State Department of Labor site specific variance decision.	F				
028213	1.07 (C) (1)	QCS	Notification Compliance Data	D				
028213	1.07 (C) (4)	QCS	Work Plan	D				
028213	1.07 (C) (2)	QCS	Abatement Contractor's Qualifications Data	D				
028213	1.07 (C) (3)	QCS	Abatement Worker's Qualifications Data	D				
028213	1.07 (C) (5)	QCS	Waste Transporter Permit	D				
028213	1.07 (C) (6)	QCS	Landfill Permit	D				
028213	1.07 (D) (1)	QCS	Waste Shipment Records and Disposal Site Receipts	F				
028213	1.07 (E) (1)	QCS	Daily Log	F				
028213	1.07 (E) (2)	QCS	Air Monitoring Data	F				
028213	1.07 (E) (2)	QCS	Negative Air Pressure Equipment: Copy of manufacturer's and performance data of all units and HEPA filters used	F				
028304			HANDLING OF LEAD CONTAINING MATERIALS					
028304	2.01 (A)	PD	Respirators	D				
028304	1.06 (B) (1)	PD	HEPA Filters (Respirators)	D				
028304	1.06 (B) (1)	PD	HEPA Filters (Vacuum Cleaners)	D				
028304	2.02	PD	Vacuum Cleaners	D				
028304	2.04	PD	Disposal Bags	D				
028304	1.06 (A) (2)	QCS	Work Plan	D	X			
028304	1.07 (C)	QCS	Lead Handling Contractor's Qualifications Data	D				
028304	1.06 (A) (1)	QCS	Lad Handling Worker's Qualifications Data	D				
028304	1.07 (C)	QCS	Testing Lab Qualifications Data	D				
028304	1.06 (A) (3)	QCS	Waste Transporter Permit	D				
028304	1.07 (C)	QCS	Landfill Permit	D				
028304	1.06 (C) (2)	QCS	Disposal Site Receipts	F				
028304	1.06 (C) (1)	QCS	Test Data	F				
028304	1.06 (C) (2)	QCS	Disposal Site Receipts	F				

SCHEDULE OF SUBMITTALS

PROJECT NO.: 46121-C

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 4 weeks for Approval (allows time for any resubmission)		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
033001			CAST IN PLACE CONCRETE					
033001	1.04 (A)	PACK	Submit product data for design mix(es) and materials for concrete at the same time as a package	D				
033001	1.03 (B)	PD	Submit EPD for concrete	D				
033001	1.03 (C)	SD	Shop drawings for reinforcement bars	D				
033001	1.03 (D) (1)	PD	Concrete design mix(es) with name and location of batching plant.	D				
033001	1.03 (D) (2)	PD	Portland Cement: Brand and manufacturer's name	D				
033001	1.03 (D) (3)	PD	Fly Ash: Name and location of source, and DOT test numbers	D				
033001	1.03 (D) (4)	PD	Air-entraining Admixture: Brand and manufacturer's name	D				
033001	1.03 (D) (5)	PD	Water-reducing Admixture: Brand and manufacturer's name	D				
033001	1.03 (D) (6)	PD	Aggregates: Name and location of source, and DOT test numbers	D				
033001	1.03 (D) (7)	PD	Lightweight Coarse Aggregate: Brand and manufacturer's name	D				
033001	1.03 (D) (8)	PD	Chemical Hardener (Dustproofing): Brand and manufacturer's name, and application instructions	D				
033001	1.03 (D) (9)	PD	Bonding Agent (Adhesive): Brand and manufacturer's name, and preparation and application instructions	D				
033001	1.03 (D) (10)	PD	Expansion Joint Filler: Brand and manufacturer's name	D				
033001	1.03 (D) (11)	PD	Emery Aggregate: Brand and manufacturer's name, and application instructions	D				
033001	1.03 (E) (1)	SAM	Samples: Fabric Reinforcement: 8 inches square	D				
033001	1.03 (E) (2)	SAM	Samples: Bar Supports: Full size	D				
033001	1.03 (F)	QCS	Certificates: Affidavit required under Quality Assurance	D				
035400			CEMENTITIOUS SELF-LEVELING TOPPING					
035400	1.02 (A)	PD	Cementitious Self-Leveling Topping	D				
035400	1.02 (A)	PD	Cleaning Agent, Bonding Agent/Primer, Sealer	D				
035400	1.02 (B)	EPD	Environmental Product Declaration	D				
035400	1.02 (C)	QCS	Test Sample: Provide field applied 5' x 5' x contract thickness sample of topping	D				
040123			MASONRY CLEANING					
040123	1.04(A)	PD	Cleaning materials manufacturer's catalog sheets, specifications and application instructions.	F				
040123	1.04(B)	QCS	Cleaning Contractor's Qualification Data, Cleaner's Qualification Data, Cleaning Procedure	D				
055000			METAL FABRICATIONS (Broadscope)					
055000	1.03(A)	SD	Metal Fabrications	D				
055000	1.03(B)	EPD	Environmental Product Declaration	D				

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PROJECT NO.: 46121-C

SUBMITTALS FOR APPROVAL				Send to:	Critical Submittals	Contractor's Projected Dates Allow at least 4 weeks for Approval (allows time for any resubmission)		
Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
055000	1.03(C)	PD	Catalog sheets, specifications, and installation instructions for each fabricated item	D				
055000	1.03(D)	QCS	Certificates	D				
057000			ORNAMENTAL METAL					
057000	1.02(A)	SD	Fabrication details and connections Include location of anchor bolts required	D	X			
057000	1.02(B)	PD	Aluminum materials	D	X			
057000	1.02(B)	PD	Stainless Steel materials	D				
057000	1.02(B)	PD	Anchors and Inserts	D				
057000	1.02(C)	SAM	Fire Rated Aluminum Composite Panels	D	X			
057000	1.02(C)	SAM	Metal Mesh Perforated Ceiling Panels	D	X			
057000	1.02(C)	SAM	Metal Finish	D	X			
057000	1.02(C)	SAM	Fittings Brackets, flanges, and other Accessories	D				
061000			ROUGH CARPENTRY					
061000	1.02(A)	QCS	Certificates: Fire-Retardant Treatment	F				
064000			ARCHITECTURAL WOODWORK					
064000	1.03(A)	SD	Show fabrication details and connections to adjacent Work	D	X			
064000	1.03(B)	PD	Plastic Laminate	D	X			
064000	1.03(B)	PD	Cabinet Door/Drawer Pulls, Surface	D	X			
064000	1.03(B)	PD	Sliding Door Pulls, Flush	D	X			
064000	1.03(C)	SAM	Kitchen Cabinets	D	X			
064000	1.03(C)	SAM	Wood Paneling	D	X			
064000	1.03(C)	SAM	Plastic Laminate	D	X			
066000			SOLID PLASTIC FABRICATIONS					
066000	1.01(B)	SD	Fabrication Details and Connection	D				
066000	1.01(C)	PD	Solid Plastic Panels	D	X			
066000	1.01(D)	SAM	Solid Plastic Panels	D	X			
066000	1.01(E)	QCS	Qualifications Certificates: Certified statement by technical representative of the panel manufacturer that the fabricator and installer are certified or approved	D	X			
066000	1.01(F)	CCS	Maintenance Data: Deliver 2 copies	F				
072100			BUILDING INSULATION					
072100	1.01(A)	PD	Rigid (Mineral Fiber Board) Insulation: Mineral fibers and water-resistant binders formed into rigid, non-combustible boards; FS HH-I-558C, Form A.	D				
072100	1.01(A)	PD	Mineral Fiber Insulation: Glass or other inorganic fibers and resinous binders formed into flexible blankets, batts or rolls; ASTM C 665.	D				
072100	1.01(A)	PD	Vapor Barrier	D				
072100	1.01(B)	SAM	Blanket, Batt or Roll	D	X			

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072100	1.01(B)	SAM	Rigid Type	D	X			
072100	1.02	QCS	Certificate Affidavit required under Quality Assurance Article	F				
078400			FIRESTOPPING					
078400	1.04(A)	PACK	Submit the following items specified below the same time as a package: Product Data, Samples, Quality Control Submittals and Firestop Schedule	D	X			
078400	1.04(B)	PD	Firestopping Device and Material	D				
078400	1.04(E)	PD	Firestopping Schedule	D	X			
078400	1.04(B)	PD	Through-Penetration Firestop Devices, Forming Materials, And Fill, Void or Cavity Materials	D				
078400	1.04(B)	PD	Accessories	D				
078400	1.04(B)	PD	Identification Labels	D				
078400	1.04(C)	SAM	Each Product requested	D				
078400	1.04(D)	QCS	Design Data	D				
078400	1.04(D)	QCS	Installer's Qualifications Data	D				
078400	1.04(D)	QCS	Company: Field Advisor Data	D				
079200			JOINT SEALERS					
079200	1.02(A)	PD	Type 1 Sealant	D	X			
079200	1.02(A)	PD	Type 1C Sealant	D	X			
079200	1.02(A)	PD	Type 1D Sealant	D	X			
079200	1.02(A)	PD	Type 2 Sealant	D	X			
079200	1.02(A)	PD	Type 2A Sealant	D	X			
079200	1.02(A)	PD	Pre-formed Sealant	D				
079200	1.02(A)	PD	Sealant Colors	D	X			
079200	1.02(A)	PD	Cork Joint Filler	D				
079200	1.02(A)	PD	Expanded Polyethylene Joint Filler	D				
079200	1.02(B)	SAM	Sealant	D	X			
079200	1.02(B)	SAM	Joint Fillers	D	X			
079200	1.02(B)	SAM	Backer Rods	D				
079200	1.02(B)	SAM	Bond Breaker Tape	D				
079200	1.02(B)	SAM	Joint Primer/Sealer/Conditioners	D				
081102			STEEL DOORS AND FRAMES					
081102	1.04(B.1)	SD	Quality Assurance Package	D				
081102	1.04(B.1)	SD	Door and Frame Schedule with Product Data Package	D	X			
081102	1.04(B.1)	SAM	Door and Frame Samples	D	X			
081102	1.04(B.2)	CCS	Closeout Submittal Package	F				
081116			ALUMINUM DOORS AND FRAMES					
081116	1.02(A)	SD	Show details of each frame type, elevation and construction for each door type - include a schedule of doors and frames	D	X			
081116	1.02(B)	PD	Frames	D	X			

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Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
081116	1.02(B)	PD	Glazed Doors	D	X			
081116	1.02(B)	PD	Aluminum tempered Glass Doors	D	X			
081116	1.02(C)	SAM	Frames	D	X			
081116	1.02(C)	SAM	Doors	D	X			
081116	1.02(C)	SAM	Color Samples	D	X			
081400			WOOD DOORS					
081400	1.03(A)	SD	Show details, elevation, and construction for each door type, location and installation requirements for Finish Hardware (including cutouts and reinforcements), and accessory items	D	X			
081400	1.03(A)	SD	Include a schedule of doors using the same reference numbers for details and openings as those on the Contract Drawings	D	X			
081400	1.03(B)	PD	Interior Flush Wood Doors (Non-Fire Rated)	D	X			
081400	1.03(B)	PD	Interior Flush Wood Doors (3/4 Hour Fire Rated)	D	X			
081400	1.03(B)	PD	Interior Flush Wood Doors (1/3 Hour Fire Rated)	D	X			
081400	1.03(B)	PD	Light Openings: Fully trimmed openings	D	X			
081400	1.03(B)	PD	Transom Panels	D	X			
081400	1.03(C)	SAM	12 x 12 inch corner sample of each door type, with panel. Factory Finished Doors: Include shop finish on samples	D	X			
081400	1.03(D)	QCS	Affidavit required under Quality Assurance Article	D	X			
083113			ACCESS DOORS					
083113	1.02(A)	PD	Non-Fire Rated Access Doors	D				
083113	1.02(A)	PD	Fire Rated Access Doors	D	X			
083323			ROLLING DOORS					
083323	1.04(A)	SD	Application to Project	D	X			
083323	1.04(B)	PD	Rolling Fire Door assemblies	D	X			
083323	1.04(B)	PD	Finishes	D	X			
083323	1.04(B)	PD	Operators	D				
083323	1.04(C)	CCS	System acceptance test for automatic closing fire doors	F	X			
083323	1.04(C)	CCS	Operation and Maintenance Data	F				
083323	1.04(C)	CCS	Replacement parts list	F				
083323	1.05(A)	CCS	Spare Parts: For each fire door, furnish 4 spare 160 degrees F fusible links	F				
087100			FINISH HARDWARE					
087100	1.03 (D.1)	SD	Quality Control Package	D	X			
087100	1.03 (D.2)	SD	Finish Hardware Package	D	X			
087100	1.03 (D.3)	CCS	Closeout Submittals Package	F				
088100			GLASS AND GLAZING					

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Spec Section	Sub Section	Type	Description	F F/O D S	Mark "X" for all that apply	Projected Transmittal Date:	Projected Approval Date:	Projected Delivery Date:
088100	1.02(A)	PD	Type A Glass	D	X			
088100	1.02(A)	PD	Type D Glass	D	X			
088100	1.02(A)	PD	Type G Glass	D	X			
088100	1.02(A)	PD	Type I Glass	D	X			
088100	1.02(A)	PD	Type J Glass	D	X			
088100	1.02(A)	PD	Type M Glass	D	X			
088100	1.02(A)	PD	Writable Glass	D	X			
088100	1.02(A)	PD	Type 1 Glazing Material	D	X			
088100	1.02(A)	PD	Type 3 Glazing Material	D	X			
088100	1.02(A)	PD	Type 5 Glazing Material	D	X			
088100	1.02(A)	PD	Type 9 Glazing Material	D	X			
088100	1.02(B)	EPD	Environmental Product Declaration	D				
088100	1.02(C)	SAM	Glass: 12 x 12 inch pieces for each type of glass specified	D	X			
088100	1.02(C)	SAM	Setting Blocks	D	X			
088100	1.02(C)	SAM	Color Samples for Glazing Materials	D	X			
088100	1.02(C)	SAM	Pattern Samples	D	X			
088100	1.02(D)	QCS	Test Reports: Certified test data to sufficiently substantiate glass or glass assembly compliance with requirements specified	D				
088100	1.02(D)	QCS	Certificates: Affidavit required under Quality Assurance Article	D				
092116			GYPSUM BOARD SYSTEMS					
092116	1.03(A)	PD	Gypsum Board	D				
092116	1.03(A)	PD	Fire Resistant Gypsum Board	D	X			
092116	1.03(A)	PD	Moisture Resistant Gypsum Board	D				
092116	1.03(A)	PD	Moisture and Fire Resistant Gypsum Board	D	X			
092116	1.03(A)	PD	Gypsum Backing Board	D				
092116	1.03(A)	PD	Shaft Wall Assembly	D	X			
092116	1.03(A)	PD	Steel Drill Screws	D				
092116	1.03(A)	PD	Laminating Adhesive	D				
092116	1.03(A)	PD	Interior Trim	D				
092116	1.03(A)	PD	Sound Attenuation Blankets	D				
092116	1.03(A)	PD	Accoustical Sealant for Exposed and Concealed Joints	D				
092116	1.03(A)	PD	Joint Tapes	D				
092116	1.03(A)	PD	Joint Compound	D				
092213			NON-LOAD BEARING FRAMING AND FURRING					
092213	1.02(A)	PD	Studs, Tracks, Furring	D				
092213	1.02(A)	PD	Fasteners	D				
092213	1.02(B)	EPD	Environmental Product Declaration	D				
092213	1.02(C)	SAM	Steel Framing and Furring	D	X			
092213	1.02(C)	SAM	Fasteners	D				
092214			FURRING FOR GYPSUM BOARD CEILINGS					

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092214	1.05(A)	PD	Main Beams	D				
092214	1.05(A)	PD	Cross Channels	D				
092214	1.05(A)	PD	Channel Mold	D				
092214	1.05(A)	PD	Cross Tees	D				
092214	1.05(A)	PD	Hangers	D				
092813			TILE BACKER BOARD					
092813	1.02(A)	PD	Tile Backer Board	D				
092813	1.02(B)	SAM	Tile Backer Board	D				
092813	1.02(B)	SAM	Joint Reinforcement	D				
093013			CERAMIC TILE					
093013	1.03(A)	PD	Ceramic Tile TL-1	D	X			
093013	1.03(A)	PD	Ceramic Tile TL-2	D	X			
093013	1.03(A)	PD	Ceramic Tile TL-3	D	X			
093013	1.03(A)	PD	Ceramic Tile TL-4	D	X			
093013	1.03(A)	PD	Trim Units	D				
093013	1.03(A)	PD	Latex-Portland Cement Mortar	D				
093013	1.03(A)	PD	Epoxy Mortar	D				
093013	1.03(A)	PD	Epoxy Adhesive	D				
093013	1.03(A)	PD	Primer	D				
093013	1.03(A)	PD	Latex-Portland Cement Grout	D				
093013	1.03(A)	PD	Epoxy Grout	D				
093013	1.03(A)	PD	Tile Grout TG - 1	D				
093013	1.03(A)	PD	Tile Grout TG - 2	D				
093013	1.03(A)	PD	Waterproofing	D				
093013	1.03(A)	PD	Colors	D	X			
093013	1.03(A)	PD	Marble Door Thresholds	D	X			
093013	1.03(B)	SAM	Tile and Grout: Each type and color required; 12 x 12 inch samples with tile mounted on braced cement backer board and grouted	D	X			
093013	1.03(B)	SAM	Trim Units: Each type and shape required	D				
093013	1.03(B)	SAM	Color Samples: Tile manufacturer's standard range of colors and textures for each tile type required	D				
093013	1.03(B)	SAM	Color Samples: Grout manufacturer's standard range of colors for each grout type required	D				
093013	1.03(B)	SAM	Marble thresholds in 6 inch lengths	D				
093013	1.03(C)	QCS	Tile Grade Certificates - each shipment	F				
093013	1.03(C)	QCS	Installer's Qualification Data	F				
093013	1.03(C)	CCS	Maintenance Data	F				
093013	1.03(C)	CCS	Extra Materials: Furnish extra tile, equal to 3 percent of the tile installed, of each type, composition, pattern, size and color of tile required. Also furnish a proportionate number of trim units	F				

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095136			WOOD CEILING SYSTEMS					
095136	1.5(A)	SD	Submit completely dimensioned ceiling layouts. Any deviations from reflected ceiling plan layouts, mainly lighting fixtures and dimensions to be indicated clearly. Also, indicate if any light fixtures will not fit into the ceiling layout due to dimensional restrictions of field conditions. Ceiling layouts to include direction and spacing of suspension members, direction and sizes of wood ceiling units, moldings at the perimeter, location and direction of lights, diffusers, etc.	D				
095136	1.5(A)	SD	Details of construction and installation at all conditions.	D				
095136	1.5(A)	SD	Materials, gauges, thickness and finishes	D				
095136	1.5(B)	PD	Manufacturer's catalog sheets, specifications, and installation instructions for Wood Ceiling Units, Concealed T Suspension system, including hangers and inserts, perimeter and column moldings, trim, and accessories for wood ceilings.	D	X			
095136	1.5(C)	SAM	Suspension System Materials - 12 inches long of exposed suspension system, component members, including moldings, for each color and system type required	D	X			
095136	1.5(C)	SAM	Wood Ceiling Units samples - full size, one of each type specified.	D	X			
095136	1.5(C)	SAM	Perimeter and column moldings, trim, and accessories for wood ceilings	D	X			
095136	1.5(D)	QCS	Certification: A manufacturer's written statement certifying that the suspension system meets or exceeds the specified structural requirements	F				
095300			SUSPENDED ACOUSTICAL CEILING SYSTEMS					
095300	1.03(A)	SD	Ceiling plans and details	D	X			
095300	1.03(B)	PD	Metal Suspension System	D	X			
095300	1.03(B)	PD	Suspension System	D	X			
095300	1.03(B)	PD	Acoustical Unit -ACT 1	D	X			
095300	1.03(B)	PD	Acoustical Unit -ACT 2	D	X			
095300	1.03(B)	PD	Acoustical Unit -ACT 3	D	X			
095300	1.03(B)	PD	Acoustical Unit -ACT 4	D	X			
095300	1.03(B)	PD	Acoustical Unit -ACT 5	D	X			
095300	1.03(C)	SAM	Suspension System Materials	D	X			
095300	1.03(C)	SAM	Acoustical Units	D	X			
095300	1.03(D)	QCS	Certification: Manufacturer's written statement	F				
095300	1.03(E)	CCS	Maintenance Instructions - 2 copies	F				
095300	1.03(E)	CCS	Furnish quantities equal to 2 percent of acoustical units and exposed suspension system components installed	F				

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095485			METAL BAFFLE CEILING SYSTEM					
095485	1.2(A)	PACK	Submit the shop drawings, product data, samples, and quality control submittals at the same time as a package	D	X			
095485	1.2(B)	SD	Reflected ceiling plans and details that show specific application to the Work. Indicate location of grid members, baffle units and other items that are part of, built-in with, or coordinated with, the ceiling system, including but not limited to light fixtures and air diffusers	D	X			
095485	1.2(C)	PD	Steel Sheet Product data	D				
095485	1.2(C)	PD	Steel Shapes Product Data	D				
095485	1.2(D)	SAM	Ceiling Support System Samples	D	X			
095485	1.2(D)	SAM	Panels Samples	D	X			
095485	1.2(D)	SAM	Color Samples	D	X			
095485	1.2(D)	SAM	Fasteners and Anchors samples	D				
095485	1.2(E)	QCS	Fire Hazard: Evidence of compliance with regulatory agency and specifications requirements - Quality Control Submission	F				
095485	1.2(E)	QCS	Test Reports: Acoustic laboratory test reports for sound absorption (NRC) and sound transmission (STC) - Quality Control Submission	F				
095485	1.2(E)	QCS	Certificates as required under Quality Assurance Article - Quality Control Submission	F				
095485	1.2(F)	QCS	Cleaning and Maintenance Instructions: Recommendations for maintenance and cleaning per Manufacturer. Identify cleaning/spotting products generically or by trade name	F				
095485	1.2(G)	CCS	Furnish 10 extra panels, matching the installed panels. Individually protect each panel with corrugated cardboard.	F				
096519			RESILIENT TILE FLOORING					
096519	1.01(A)	PD	Vinyl Composition Tile Type IV (VCT -1)	D	X			
096519	1.01(A)	PD	Vinyl Tile Type III (LVT -1)	D	X			
096519	1.01(A)	PD	Vinyl Tile Type III (LVT -2)	D	X			
096519	1.01(A)	PD	Rubber Base (RB-1)	D				
096519	1.01(A)	PD	Rubber Base (RB-2)	D				
096519	1.01(A)	PD	Metal Edge Strips	D				
096519	1.01(A)	PD	Resilient Edge Strips	D				
096519	1.01(A)	PD	Resilient Feature Strips	D				
096519	1.01(A)	PD	Underlayment (Mastic Type)	D				
096519	1.01(A)	PD	Underlayment (Felt)	D				
096519	1.01(A)	PD	Primer for Porous Dusty Concrete	D				
096519	1.01(A)	PD	Tile Adhesive	D				
096519	1.01(A)	PD	Floor Finish	D	X			
096519	1.01(B)	SAM	Resilient Tile	D	X			

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096519	1.01(B)	SAM	Base	D	X			
096519	1.01(B)	SAM	Edge Strips	D	X			
096519	1.01(B)	SAM	Color Samples	D	X			
096519	1.01(C)	QCS	Certificates Quality Assurance Article	F				
096519	1.01(D)	CCS	Maintenance Data - 2 copies	F				
096519	1.04(A)	CCS	Extra Materials: Furnish extra tile, equal to 2 percent of the tile installed, of each type and color of tile required	F				
096723			EPOXY RESIN FLOORING					
096723	1.03(B)	SD	Provide floor plans, laying out and indicating what type of floor goes in each location.	D	X			
096723	1.03(A)	PD	Fill	D				
096723	1.03(A)	PD	Underlayment	D				
096723	1.03(A)	PD	Waterproofing	D				
096723	1.03(A)	PD	Primer	D				
096723	1.03(A)	PD	Type ECT Flooring and Base	D				
096723	1.03(A)	PD	Sealer	D				
096723	1.03(A)	PD	Metal Accessories	D				
096723	1.03(A)	PD	Sealant	D				
096723	1.03(C)	SAM	Flooring and Base Combination	D	X			
096723	1.03(C)	SAM	Underlayment Components	D	X			
096723	1.03(C)	SAM	Liquid Binder for Reinforcement	D	X			
096723	1.03(C)	SAM	Clear Sealer	D	X			
096723	1.03(D)	QCS	Test Reports: At the request of the Director, furnish test reports from an independent testing laboratory showing that the submitted flooring materials meet or exceed specified physical properties and performance requirements.	F				
096723	1.03(D)	QCS	Certificates: Affidavit required under Article 3.01.	F				
096723	1.03(D)	QCS	Installer's Qualifications Data: Affidavit required under Quality Assurance Article.	F				
096723	1.03(D)	QCS	List of Completed Installations: At the request of the Director, furnish a list of at least 5 comparable installations of the submitted flooring	F				
096723	1.03(E)	CCS	Maintenance Data: Deliver 2 copies of the flooring manufacturer's printed recommendations for cleaning and maintaining the installed flooring to the Director's Representative	F				
096813			TILE CARPETING					
096813	1.02(A)	SD	Dimensions, pattern direction, and seam diagram	D	X			
096813	1.02(B)	PD	Tile Carpeting	D	X			
096813	1.02(B)	PD	Edge Strips	D				
096813	1.02(B)	PD	Adhesive	D				

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096813	1.02(C)	SAM	Tile Carpeting	D	X			
096813	1.02(C)	SAM	Edge Strip	D	X			
096813	1.02(C)	SAM	Color Samples	D	X			
096813	1.02(D)	QCS	Certificates - Quality Assurance Article	F				
096813	1.02(E)	CCS	Maintenance and Cleaning Instructions - 2 copies	F				
096813	1.02(E)	CCS	Manufacturer's Warranty	F				
096813	1.06(A)	CCS	Extra materials: Tile Carpeting: Full size units equal to 5 percent of amount installed	F				
099101			CONSTRUCTION PAINTING					
099101	1.02(A)	PD	Painting Schedule for Interior Substrates for tag numbers PT-1, PT-2, PT-3, PT-4, PT-5.	D	X			
099101	1.02(B)	PD	Paint Type IAL-1: Interior Acrylic Latex, Flat	D	X			
099101	1.02(B)	PD	Paint Type IAL-2: Interior Acrylic Latex, Eggshell	D	X			
099101	1.02(B)	PD	Paint Type IAL-3: Interior Acrylic Latex, Semigloss Enamel	D	X			
099101	1.02(B)	PD	Paint Type IAL-4: Interior Acrylic Latex, Gloss Enamel	D	X			
099101	1.02(B)	PD	Paint Type ISP: Interior Steel Primer, Flat	D	X			
099101	1.02(B)	PD	Paint Type ICOS: Interior Clear Oil Stain, Satin	D	X			
099101	1.02(B)	PD	Paint Type ITOS: Interior Tinted Oil Stain, Satin	D	X			
099101	1.02(B)	PD	Paint Type ITS: Interior Transparent Stain, Satin	D	X			
099101	1.02(B)	PD	Paint Type IPV-1: Interior Polyurethane Varnish, Flat	D	X			
099101	1.02(B)	PD	Paint Type IPV-2: Interior Polyurethane Varnish, Satin	D	X			
099101	1.02(B)	PD	Paint Type IPV-3: Interior Polyurethane Varnish, High Gloss	D	X			
099101	1.02(B)	PD	Colors	D	X			
099101	1.02(C)	SAM	Finish Paint Samples: Two finish paint samples applied over recommended primers for each substrate to be painted.	D	X			
099101	1.02(D)	QCS	Test Reports: Furnish certified test results from an independent testing laboratory showing that products submitted comply with the specifications, if requested by the Director's Representative.	F				
099101	1.02(D)	QCS	Certificates: Furnish certificates of compliance required under QUALITY ASSURANCE Article.	F				
099101	1.06(A)	CCS	Extra Materials: Paint Type EAL-1 and IAL-1: Four gallons, each type	F				
099101	1.06(A)	CCS	Extra Materials: Paint Types EAL-2 and IAL-2: Two gallons, each type	F				
099101	1.06(A)	CCS	Extra Materials: Other Paint Types: One gallon, each type.	F				
101113			MARKERBOARDS AND TACKBOARDS					

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101113	1.01(A)	SD	Show fabrication details and connections to adjacent Work.	D	X			
101113	1.01(B)	PD	Markerboard (porcelain enameled face)	D	X			
101113	1.01(B)	PD	Tackboard (vinyl cork)	D	X			
101113	1.01(B)	PD	Aluminum Trim	D	X			
101113	1.01(C)	SAM	Markerboard	D	X			
101113	1.01(C)	SAM	Tackboard	D	X			
101113	1.01(C)	SAM	Aluminum Trim	D	X			
101113	1.01(C)	SAM	Fasteners	D	X			
101423			SIGNS					
101423	1.02(A)	SD	Show Fabrication and mounting details	D	X			
101424	1.02(B)	PD	Catalog sheets, specifications, and installation instructions for each sign type and mounting type specified.	D	X			
101424	1.02(C)	SD	Submit signage location plan along with schedule.	D	X			
101423	1.02(D)	SAM	Full size of each sign type and copy type specified including mounting accessories. T	D	X			
101423	1.02(D)	SAM	Color Samples	D	X			
101423	1.02(E)	QCS	Sign Fabricator Qualification Data	F				
102100			TOILET COMPARTMENTS					
102100	1.03(A)	SD	Fabrication details and connections	D	X			
102100	1.03(B)	PD	Solid Plastic Panels	D	X			
102100	1.03(B)	PD	Fittings and Fasteners	D				
102100	1.03(B)	PD	Overhead bracing	D				
102100	1.03(B)	PD	Wall Supports	D				
102100	1.03(B)	PD	Door Hardware	D				
102100	1.03(C)	SAM	Hardware	D	X			
102100	1.03(C)	SAM	Panel Sections	D				
102100	1.03(C)	SAM	Overhead Bracing	D				
102100	1.03(C)	SAM	Pilaster Leveling Device (Ceiling or Floor Type)	D				
102100	1.03(C)	SAM	Bracket Fittings	D				
102100	1.03(C)	SAM	Fasteners	D				
102100	1.03(C)	SAM	Curtain Hooks	D				
102613			WALL AND CORNER GUARDS					
102613	1.01(C)	PD	PVC Wall Guards	D	X			
102613	1.01(C)	PD	PVC Corner Guards	D	X			
102613	1.01(C)	PD	Fasteners	D	X			
102613	1.01(B)	SAM	Color Samples	D	X			
102613	1.01(A)	SAM	Tamper Resistant Fasteners: Each type required	D	X			
102813			TOILET AND BATH ACCESSORIES					
102813	1.02(A)	PD	Mirrors	D	X			

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102813	1.02(A)	PD	Toilet Tissue Dispensers - Surface Mounted (TTD-SM)	D	X			
102813	1.02(A)	PD	Combination Paper Towel Dispensers and Waste Receptacles (PTD & WR)	D	X			
102813	1.02(A)	PD	Feminine Napkin Disposals - Surface Mounted (FND-SM)	D	X			
102813	1.02(A)	PD	Lather Soap Dispensers - Surface Mounted (LSD-SM)	D	X			
102813	1.02(A)	PD	Mop and Broom Holders (M & BH)	D	X			
102813	1.02(A)	PD	Grab Bars (GB)	D	X			
102813	1.02(B)	CCS	Operation and Maintenance Data	F				
102813	1.02(B)	CCS	Parts lists	F				
102813	1.02(B)	CCS	Keys: Furnish minimum of 2 keys and an additional 2 keys for every 6 key operated accessories.	F				
102813	1.02(B)	CCS	Tools: Furnish socket wrenches compatible with set screws of concealed theft-resistant fastenings. Furnish minimum of 2 wrenches and an additional 2 wrenches for every 6 accessories having such fastenings	F				
104413			FIRE PROTECTION CABINETS					
104413	1.3(A)	PD	Fire Protection Cabinet	D				
104413	1.3(B)	SAM	Each type of exposed finish	D				
105123			PLASTIC-LAMINATE-CLAD WOOD LOCKERS					
105123	1.2(A)	SD	Fabrication details and connections	D	X			
105123	1.2(B)	PD	Lockers	D	X			
105123	1.2(B)	PD	Hardware	D	X			
105123	1.2(B)	PD	Trim Panels	D	X			
105123	1.2(C)	SAM	6" x 6" samples of finish for each type of locker	D	X			
115213			PROJECTION SCREENS					
115213	1.04(A)	PD	Projections Screens	D	X			
115213	1.04(A)	SD	Installation drawings & wiring diagrams	D	X			
115213	1.03(A)	QCS	Manufacturers specifications and recommendations	F	X			
115213	1.05(A)	CCS	Operation and maintenance data	F	X			
115300			LABORATORY EQUIPMENT					
115300	1.02(A)	PD	Product data for Biological Safety Cabinets	D	X			
115300	1.02(A)	PD	Product data for Water Purifier Systems	D	X			
115300	1.02(A)	PD	Product data for CO2 Incubators	D	X			
115300	1.02(B)	SD	Shop Drawings for Biological Safety Cabinets	D	X			
115300	1.03(A)	QCS	Field quality-control reports	F				
115300	1.04(A)	CCS	Operation and maintenance data	F				
115300	1.04(A)	CCS	Extra Materials: Furnish complete touch up kit, Provide one extra filter of each type for BSC	F				
115300	1.04(A)	CCS	Warranty for Biological Safety Cabinets	F				

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115313			LABORATORY FUME HOODS					
115313	1.04(A)	PD	Product data for FH-5B fume hood	D	X			
115313	1.04(B)	SD	Shop Drawings for laboratory fume hoods	D	X			
115313	1.04(C)	SAM	For fume hood exterior finishes, interior lining and work top material(s), service fitting finishes and other materials requiring color selection	D	X			
115313	1.05 (A) (B) (C)	QCS	Product test reports for Fume Hoods, Chemical Resistant Finish System and Fume Hood Work Top Materials	D	X			
115313	1.05 (D)	QCS	Field quality-control reports	F				
115313	1.06(A)	CCS	Operation and maintenance data	F				
115313	1.08 (A)	CCS	Extra Materials: Furnish complete touch up kit	F				
115313	1.04 (D)	QCS	Delegated Design Submittal for fume hoods indicated to comply with seismic performance requirements and design criteria	D	X			
122400			SOLAR SHADE					
122400	1.4	PD	Manufacturer's Data Sheets	D	X			
122400	1.4	PD	Window Treatment Schedule	D	X			
122400	1.4	SD	Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work	D	X			
122400	1.4	SAM	Complete set of shade components, cloth samples and aluminum finish samples	D				
122400	1.4	QCS	Manufacturer's Certificates	D				
122400	1.4	QCS	Manufacturer's Warranty	D				
122400	1.4	CCS	Manufacturer's Maintenance Data					
123553			LABORATORY CASEWORK					
123553	1.04(A)	PD	Product data for metal laboratory casework	D	X			
123553	1.04(A)	PD	Product data for special purpose lab casework	D	X			
123553	1.04(A)	PD	Product data for shelving	D	X			
123553	1.04(A)	PD	Product data for adaptable laboratory casework systems	D	X			
123553	1.04(A)	PD	Product data for laboratory work surfaces	D	X			
123553	1.04(A)	PD	Product data for laboratory sinks	D	X			
123553	1.04(A)	PD	Product data for casework accessories	D	X			
123553	1.04(A)	PD	Product data for water, lab gas, safety, and electrical service fittings	D	X			
123553	1.04(A)	PD	Product data for ceiling service panels	D	X			
123553	1.04(B)	SD	For laboratory casework. Include plans, elevations, sections and attachment details	D	X			
123553	1.04(C)	SAM	For cabinet finishes, hardware finishes, countertops, service fittings finishes and other materials requiring color selection	D	X			
123553	1.05(A) (B)	QCS	Product Test Reports	F				
123553	1.05(C)	QCS	Product Certificates	F				

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123553	1.06(A)	CCS	Operation and maintenance data	F				
123553	1.09(A) (B)	CCS	Extra Materials: Furnish complete touch up kit, cabinet mounting clips and related hardware	F				
123553	1.04(D)	QCS	Delegated Design Submittal for laboratory casework indicated to comply with seismic performance requirements, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.	D	X			
124053			LABORATORY ACCESSORIES					
124053	1.03(A)	PD	Product data for cylinder bracket	D	X			
124053	1.03(A)	PD	Product data for lab coat rack	D	X			
124053	1.03(A)	PD	Product data for acrylic splash guard	D	X			
124053	1.03(A)	PD	Product data for blackout curtain with valance	D	X			
124053	1.03(B)	SD	For laboratory accessories. Include plans, elevations, sections and attachment details	D	X			
124053	1.03(C)	SAM	For each exposed product material requiring color selection	D	X			
124053	1.04(A)	QCS	Field quality-control reports	F				
124053	1.05(A)	CCS	Operation and maintenance data	F				
124053	1.08(A)	CCS	Extra Materials: Furnish complete touch up kit	F				